OE 6000 (9-65) DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
OFFICE OF EDUCATION
WASHINGTON 25, D.C.

ERIC DOCUMENT RESUME

DATE OF RESUME: December 31, 1966

1. ACCESSION NO.
2. ERIC SATELLITE CODE
3. CLEARING HOUSE CONTROL NO.

FOR INTERNAL ERIC USE ONLY
(Do Not Write In Space Below)

4. SOURCE: University of Oregon

DATE RECEIVED

IS MICROFILM COPY AVAILABLE? *(Check one)* ☐ Yes ☐ No

5. TITLE: A COLLATIVE REPORT ON ARCHITECTURAL RECOMMENDATIONS FOR SECONDARY SCHOOL AND TERTIARY SCHOOL THEATRE SPACE AND EQUIPMENT
Cooperative Research Project No. 5-8290 Final Report

IS DOCUMENT COPYRIGHTED? *(Check one)* ☐ Yes ☐ No

HAS COPYRIGHT RELEASE BEEN GRANTED? *(Check one)* ☐ Yes ☐ No

6. AUTHOR(S): Horace W. Robinson

7. DATE: 12/66
8. PAGINATION: 107p.
9. REFERENCES

DATE, NAME, AND COMPLETE ADDRESS OF AUTHORITY
TYPE OF RELEASE

10. REPORT/SERIES NO.: OE-6-10-025
11. CONTRACT NO.: OE-6-10-025

12. PUBLICATION TITLE: N.A.
13. EDITOR(S): N.A.
14. PUBLISHER: N.A.

15. ABSTRACT *(250 words max.)*

A preliminary study of the status of theatre as a subject matter at the secondary level is made and also an investigation as to the prevailing and proposed methods of teaching of the subject. Using this material as a basis, a panel of experts analyze the theatrical space and equipment needs of the secondary school. The presumption is made that the material provided by the panel will be useful at the tertiary level also. Recommendations are made for auditorium and stage including dimensional data, space allocations and materials: also, an analysis of the various stage forms as they apply at this level. The public service areas, such as lobby, foyer, rest rooms, and ticket offices are described and flow patterns established. The backstage work areas including shops, dressing rooms, green room, storage areas and rehearsal areas are outlined with comments on the peculiar properties of each. Equipment for all areas such as lighting control, lighting instruments, rigging, draperies and sound equipment is listed and comparative evaluations drawn. A proposal is made for a new space identified as the Theatre Arts Laboratory Teaching Station. It is outlined primarily as a classroom, but with production possibilities. A general discussion of the relative merits of divisible auditoriums, arena theatre, thrust stage, open stage and additional comments on specific problems such as acoustics, personnel, etc., conclude the report. The text is illustrated with marginal drawings of a descriptive and editorial nature, and an extensive bibliography is provided as a source for independent study of the items examined by the panel of experts.

16. RETRIEVAL TERMS *(Continue on reverse)*

17. IDENTIFIERS

ERIC
S-345

FINAL REPORT
Project No. 5-8290
Contract No. OE-6-10-025

S-345

U. S. DEPARTMENT OF HEALTH, EDUCATION AND WELFARE
Office of Education
This document has been reproduced exactly as received from the person or organization originating it. Points of view or opinions stated do not necessarily represent official Office of Education position or policy.

A COLLATIVE REPORT ON ARCHITECTURAL RECOMMENDATIONS FOR SECONDARY SCHOOL AND TERTIARY SCHOOL THEATRE SPACE AND EQUIPMENT

December 1966

U.S. DEPARTMENT OF
HEALTH, EDUCATION, AND WELFARE

Office of Education
Bureau of Research

A COLLATIVE REPORT ON ARCHITECTURAL RECOMMENDATIONS FOR SECONDARY SCHOOL AND TERTIARY SCHOOL THEATRE SPACE AND EQUIPMENT

Cooperative Research Project No. 5-8290
Contract No. OE-6-10-025

HORACE W. ROBINSON

1966

The research reported herein was performed pursuant to a contract with the Office of Education, U.S. Department of Health, Education, and Welfare. Contractors undertaking such projects under Government sponsorship are encouraged to express freely their professional judgment in the conduct of the project. Points of view or opinions stated do not, therefore, necessarily represent official Office of Education position or policy.

University of Oregon

Eugene, Oregon

TABLE OF CONTENTS

Preface iii

I. The Planning of the Physical Plant in the Modern Concept of Secondary School Theatre 1

II. Auditorium and Stage 15

III. The Public Service Areas 35

IV. Backstage Work Areas 43

V. Equipment 52

VI. The Theatre Arts Labratory Teaching Station 69

VII. Divisible Auditoriums, Arena Theatre, Thrust Stage and Other Theatre Forms for the Secondary School 76

VIII. Related Considerations 82

Appendices:

A. Biographical Information on the Participants A-1

B. Bibliography B-1

PREFACE

The increased theatre activity in the secondary schools of both a curricular and an extra curricular nature has suggested the need of a thorough examination of the physical needs of this subject matter. The editor's interest was initially aroused by a study conducted by the Southern California Section of the American Educational Theatre Association for the Los Angeles City School System. This ultimately led to a number of publications on the subject and when Professor Jack Morrison served as Dance and Theatre Consultant in the Office of Education he suggested that a formal study of the problems should be undertaken by that office. A contract was negotiated with the University of Oregon to conduct the study under the direction of Horace W. Robinson, Director of the University Theatre at that institution. The investigation plan developed by Professor Robinson involved the assembling of leading architects, consultants and educators for a six day conference in Eugene, Oregon, during the summer of 1966. A list of the participants in the conference and their background and qualifications appear elsewhere. (In the body of the report this group of experts will be identified merely as the PANEL). Professor Robinson (editor of this report) announced that the discussions would cover the nature and function of curricular and extra-curricular theatre at the secondary level (including methodology in teaching and basic philosophy of theatre training).

Having established some common ground here the discussion would continue to specific recommendations dealing with space and equipment. Two position papers were presented by each participant, and each of these presentations was followed by vigorous inquiry and discussion. There were many substantial disagreements. In the following material the editor has not attempted to present a compromise somewhere between the conflicting views, but a synthesis and essence of the findings with proper recognition and reporting of minority opinion. The discussions, although often heated, revealed the high respect the conferees held for each other as specialists. At the close of the meeting it was generally agreed that the sessions had been highly informative, and hope was expressed that eventual publication of the findings would provide more efficient and adaptable space and equipment for secondary school theatre activity. The position papers included treatment of the problems of personnel, engineering, teaching methods, equipment, acoustics, classroom facilities, public service areas, stage and auditorium, tools, etc. Although the individual called upon to present a paper in each area was a recognized authority in that field, there has been no attempt to identify their contribution in this report. The chairman (the editor) takes full responsibility for the report, although it has been submitted to the separate contributors for comment and correction. Perhaps for

the first time, all of the vested interests in educational theatre building have had an equal hearing: secondary school theatre teachers, architects, theatre architecture consultants, professional educators, school superintendents, equipment sales representatives, theatre technicians, engineers and acousticians. Brought face to face with each other and barraged with questions, forced to strong defense or brought to grudging admission, a general understanding of the widely divergent, but common problems, ensued. No attempt was made to include a school board representative. This was not because his point of view on financing or school philosophy was not needed, but because this would be the one non-professional expression of opinion, and it is highly doubtful that any individual could properly represent his associates as a class. Reports from the participants, however, frequently gave consideration to the varied attitudes and concerns of these representatives of the public who are generally charged with the responsibility of budgets, policy and procedure.

The basic orientation of the study is the secondary school theatre. However, it was quite apparent in the conference that any discussion of academic theatre cannot be rigidly confined to restricted levels. The discussions frequently touched on the problems of the elementary school, and even more frequently on those of the college and university. The various applications should be apparent

to even the most casual reader, and the basic guide lines laid down in the report should be useful at all levels of theatre construction. The good high school auditorium, with only slight modification and proper auxiliary service areas and equipment, becomes an equally good college or university theatre. The hope is that the usefulness of the material will extend far beyond the limits of the secondary school, which was the frame of reference for most of the discussions. The essential information, the dimensions, the philosophy of modern theatre teaching at the secondary school level, is presented here as it has been prepared by the recognized leaders in the field. The basic principles may be applied in many combinations, but the report will provide a common vocabulary, an educational objective, and the basic architectural requirements. Because it is presumed that this report will be of general interest, it has been prepared in layman's language in the hope that it will be useful to a larger segment of the public.

Upon occasion some parenthetical note is introduced in this form which may represent a very personal reaction to a problem, or some kind of comment inspired by, but not always related to, the immediate discussion.

The report will not name specific architects, firms of architects, consultants, manufacturers or trade names of products, as it is not the

intention of the report to promote or discourage the use of specific concepts or trade items.

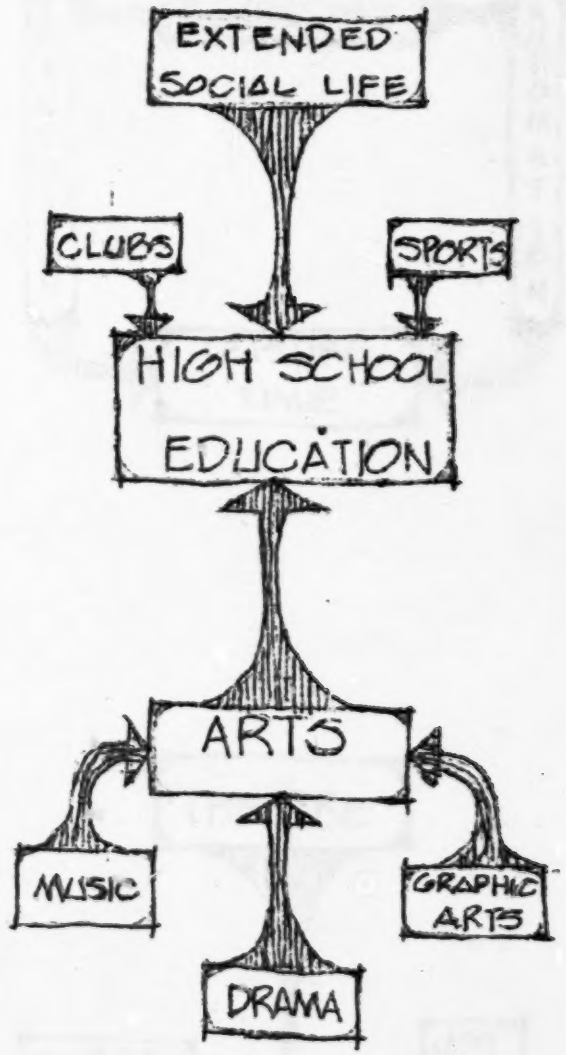
Dealing with relatively broad generalizations, the PANEL feels that it is not possible, within the limitations of this report, to provide answers to all secondary school theatre architecture problems. However, the study will present a basic philosophy and a method of procedure. More specific details can be gained from a study of those sources listed in the bibliography. The PANEL presents the separate bibliographical items as related studies, but does not certify all of the content included therein. The greatest service can be provided by the services of the theatre architecture consultant, whose function is detailed in Chapter I.

The material is not designed to be restrictive but permissive. It is designed to be of service to the secondary school teacher in drawing up specifications for a projected plant, for the use of the individual administrator as a basis for evaluation of proposals, as a suggestion of alternate solutions, as a guideline for standard, recommended facilities, for the board member as he evaluates the investment in terms of money, space and personnel for this particular teaching area, and for the architect and builder who, although well versed in planning, may lack some of the specific information necessary for the planning of an efficient plant.

Chapter I
THE PLANNING OF THE PHYSICAL PLANT IN THE MODERN CONCEPT OF SECONDARY SCHOOL THEATRE

Recent writings of educators abound with awareness of the increasingly crucial need of providing for, in the public schools of the United States, the development of the essentially human, creative faculties of the young. The call is up for the fusion of the personal-social concerns of the 1930's and 40's, with the intellectual gains of the 50's and 60's, and for attuning the curriculum much better to the needs of the individual without sacrificing intellectual content. Of vital concern, then, is the inclusion of theatre arts in the curriculum of the secondary schools. This assertion is based on economic and aesthetic factors which are integral to the purposes of education, and is rooted in the common foundations of all learning: man's capacity to explore, wonder, and reflect, and his desire to seek out the meaning and beauty of existence.

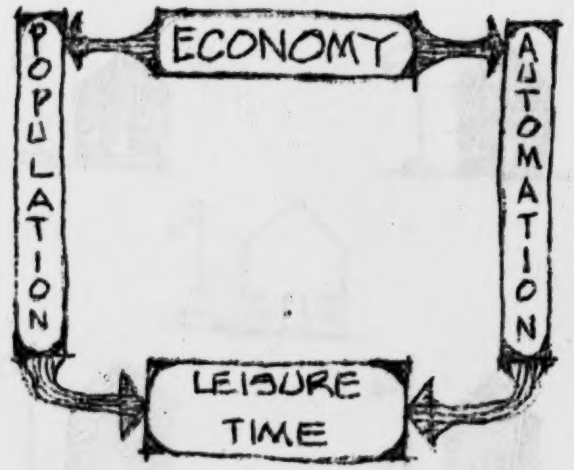
The combination of automation and population growth is producing a condition of production-consumption imbalance which can only be rectified by the change of orientation in the occupations of a large portion of the population. The entire employable population is no longer needed to produce the material necessities of civilized existence, and the number needed will decline even as the population increases. Even now, as much of the nation's wealth of materials and creative manpower are consumed in production for destruction and in destruction itself,

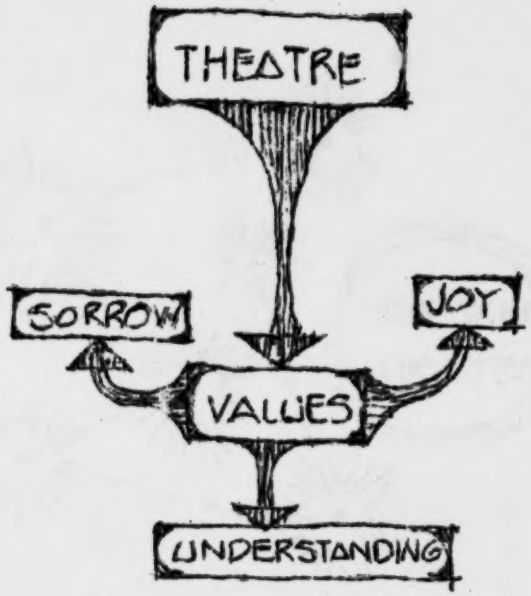


there is need for more attention by more people to salutary activities quite apart from those aimed solely at the production of material goods. It is even true that the affluence created by the "defense" economy is enabling more and more people to follow inclinations to see plays, to attend art shows and to own painting, to go to concerts and surround themselves with stereo-reproduced music.

The words of philosophers and experience have proven that the greatest satisfactions for the human spirit are the non-material ones. Although the priority of survival needs is recognized, beyond these are the needs for the enrichment of the mind, the enjoyment of beauty and the active exercise of sympathy, as opposed to the accumulation of more and bigger, shinier, faster and costlier possessions.

Theatre looks at life and comments on it; it stretches the imaginations of those who participate and view, who express and perceive their understanding of, and sympathy with, the sufferings and the joys of others; it excites and pleases the senses of sight and hearing. The making of theatre gives great pleasure in the endeavor, great satisfaction in the accomplishment, and the highest elation, in so doing, of imparting pleasure, enjoyment, understanding and sympathy of others. These are among the highest values achievable in human existence; they reside in the arts as they do in religious worship. It is a high commitment to the future of the race to impart them to the young by teaching theatre.

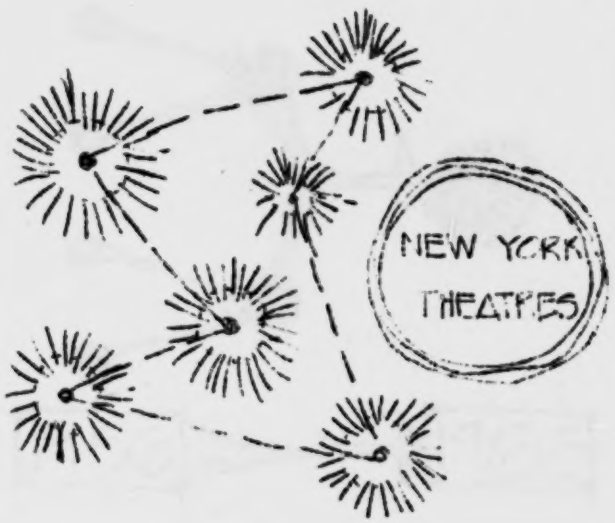




A growing awareness of this commitment is being evidenced. Of the approximately 30,000 high schools in the nation, about 26,000 have some sort of producing program. These programs range from those which produce the single class play or elemental talent show, to the kind with several areas of instruction and performances which result from the attainment of competence thru class work. Though past emphasis has been on the "activity" concept of theatre, with its accompanying stress on the multi-purpose facility, changes are occurring in both theatre and education which may be expected to alter this emphasis and lead to an increased accommodation of theatre arts in both the curricular and extra-curricular programs of the school.

The spread of theatre away from New York is one of these changes. Though it is not foreseen that the center of the commercial theatre will soon move from that city, regional, civic and school theatres are now providing a theatre source which at one time was thought out of the question. The imminence of a shortened work week and the rise of interest in culture indicate the likelihood of theatrical interest beyond that ever before experienced in the United States. The federal government's programs, such as the National Council on the Arts and the Humanities, point this up as do the efforts of Actor's Equity Foundation, Department to Extend the Professional Theatre, to push the range of its members beyond Broadway.

87% HAVE PROGRAMS IN THEATRE



Indicative of changes in educational concepts which will lead to the continued growth of theatre arts in the secondary schools are the programs in North Carolina, Georgia, New Jersey, Illinois, and in the cities of New York and Detroit where theatre education has been included as a special part of the training of gifted students. Even more significant, however, are the curriculum and scheduling changes which are designed more and more to foster the creativity of the individual. Flexibility in the scheduling of classes will make it possible for students who are interested to spend a greater portion of their day working in the area of theatre. With the trend towzrd team teaching as a means of providing expertness in every discipline and unification, unified humanities programs are springing up, as are combinations of the creative arts with the humanities or the social studies.

Of additional significance is the growing number of large schools with the accompanying specialization of teachers. Between 1956 and 1966, the number of school districts in the United States was reduced from 54,589 to 26,802. By 1964, 55.6% of pupils were enrolled in school systems of 6,000 or more. High schools that enroll 1500 students or more are becoming more common as their operation proves increasingly feasible. The pattern set by these schools, which allows for the growth of the theatre program, will be more common than ever before.

Building trends observed since 1961 also signify a growth of interest. Of the building projects surveyed, 95.5% had some sort of theatre facility and 50% had auditoriums. This indicates that a rising percentage of building planners will be including comparable provisions.

Although the extra-curricular theatre program will continue to be an ingredient of the secondary school experience, it is viewed less and less as the apex of that experience. The benefits of theatre art do not accrue in education thru the production program alone. There must be classwork which is especially geared to high school experience, from which performance will naturally result.

In business, in government, and in education, greater and greater stress is being given to the treasuring and fostering of creativity. There is, therefore, a place for theatre arts in every school system which hopes to fulfill its role in the developments of the future.

Considering the strong position of the theatre in the secondary school curriculum, and the need for a vigorous imaginative approach, it is obvious that the architectural solution to theatre space can neither be rigidly curcumscribed, nor can it be basically conservative. The existence of a growing curriculum, serviced by dedicated and well prepared teachers, points up the need for a careful analysis of space needs and equipment for fear that the new movement will be hampered with

lack of informed opinion, or pledged to the perpetuation of outmoded forms, because no better prototype exists. This report is designed to examine the full spectrum of architectural possibilities, and to comment briefly on them. Those forms which, in the opinion of the PANEL, offer the greatest promise will be explored in greater detail with specific notes of caution about pedagogical pitfalls, suggested dimensional data and cost estimates where pertinent. It is not a matter of consequence that the report be accepted in its entirety by any one group in any one situation. There are ideas here which the PANEL hopes will be of interest and service to any theatre practitioner. This is not a SOLUTION to all the structural and space problems of the secondary school. Hopefully, it is a collative report by a panel of experts containing pertinent, sympathetic and helpful information which may lead the teacher, the school administrator, and the architect to THEIR SOLUTION to a specific problem.

All planning for secondary school theatre must start with the theatre teacher or teachers in a specific teaching situation.

> *"Building a theatre around the philosophy of an incumbent teacher who may leave may be hazardous, but pouring money (and concrete) into a plant based on the imagined philosophy of an unknown future tenent is courting disaster."*

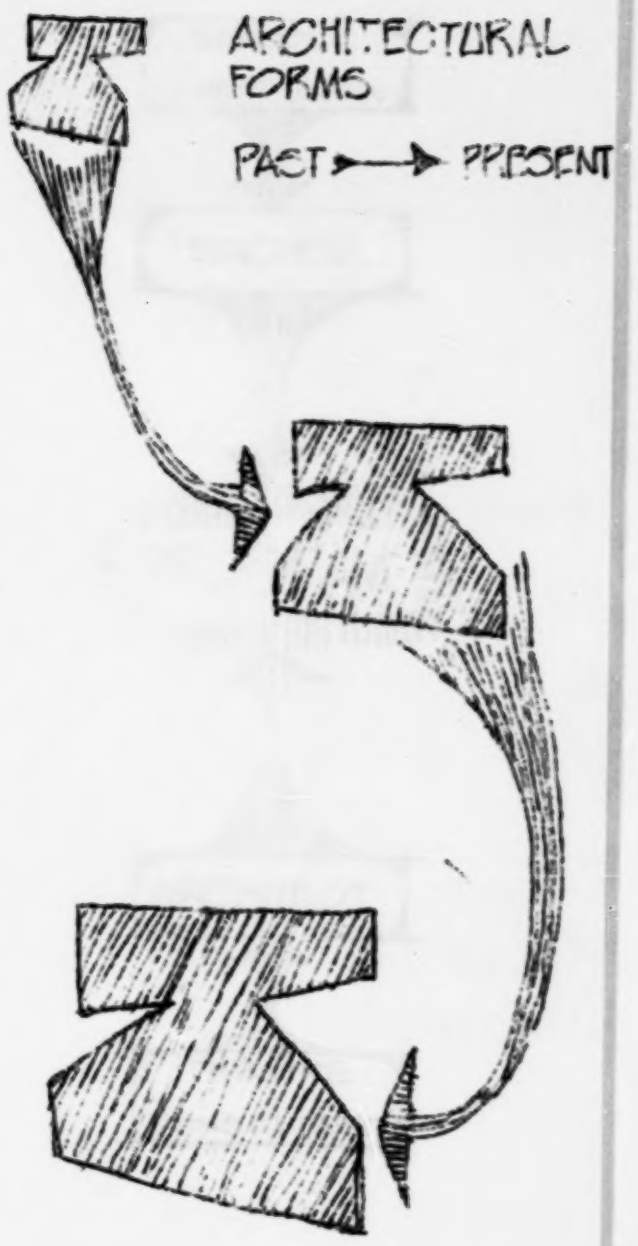
This report will help to clarify the position of the teacher, and will give others

a yardstick by which to measure that teacher's reflection of modern educational theatre philosophy. A major moving force in the planning must be the school administrator, who is in a position to evaluate the theatre program in relation to the other needs of the school or the district. He will advise the local school board whether to commit time, space and money to the project. From his knowledge of the professional services available, he will recommend a competent firm of architects who may be contracted to do a study of the needs of the system, or commissioned to develop preliminary plans for the structure. Frequently such firms have had some experience in public school structures, and they may indeed specialize in this type of work, but it is generally agreed *there are no local architects who are specialists in academic theatre building.* This presents an unusual problem in that the architect, and perhaps the school system, is launching on a program of building about which they know little. Too often they are content to visit another building which has some reputation for efficiency or pleasant design and presume that if some improvements and modernizations are made on that plant (which was developed for another town, another group of students, another site, and another teaching philosophy) it will serve their needs.

The visiting teacher graciously invited to accompany the delegation is envious of all of the space, the shining equipment, the

apparent efficiency as compared to the cramped and tingy quarters which is now called home and eagerly agrees at the end of the hour tour that "one like this would be fine...only bigger!"

So the poor model is perpetuated, and another "standard" structure develops. The missing ingredient in this planning is the theatre CONSULTANT. Because of the increasing sophistication of modern building, architects are turning wisely to a new profession of consultants to provide them with the detailed information they require for specific jobs. The theatre consultant is a relatively recent addition to this list and those who specialize in academic theatre structures have an additional expertise. From the beginning the planning team must, therefore, consist of the teacher, the school administrator, the architect and the theatre consultant. It is of utmost importance that the consultant be added to the team before it starts to work. The consultant can save much time and money in the early process while he will cost added money if he is brought in late to revise plans as they are going to bid, or make structural changes as the building is rising, or, worst of all, called in to recommend changes in the building or equipment after the second or third year of unsuccessful operation. The fee of the consultant is generally more than absorbed by the savings which he can affect. Many consultants take pride in guaranteeing savings while increasing efficiency. Competent theatre consultants



are available in all parts of the country. Although there is no organization at present which will certify or accredit consultants, there are a number who do serve as agencies through which contact can be established. The American Educational Theatre Association, John F. Kennedy Center for the Performing Arts, Suite 500 , 1701 Pennsylvania Avenue; The American National Theatre and Academy, 245 West 52nd St., New York, N.Y.; and the United States Institute for Theatre Technology, Inc., 245 West 52nd St., New York, N.Y. will supply lists of practicing consultants. Inquiries directed to agencies who have employed the services of these consultants will hopefully result in testimony as to their ability and working methods. Failing to find an officially designated consultant, an appeal to those in charge of the technical theatre work at the nearest large university should produce informed assistance. In addition to the theatre consultant, the architect will probably call for the assistance of other specialists unless such expert knowledge is available in his own firm: usually requesting the services of acoustical engineers, mechanical engineers, structural engineers, and electrical engineers. The importance of acoustical treatment cannot be overemphasized, and specific information is supplied on this subject in Chapter VIII.

The group now formulated as a TEAM will proceed to draw up the building program. They must start with an open mind and few limitations. Tentative sketches which

propose an exterior form should be avoided until all members of the TEAM agree that they know what is going to happen inside the proposed structure and why. At this stage it will be necessary to refuse to make any concessions to substandard building.

"After all we are building a school not a theatre."

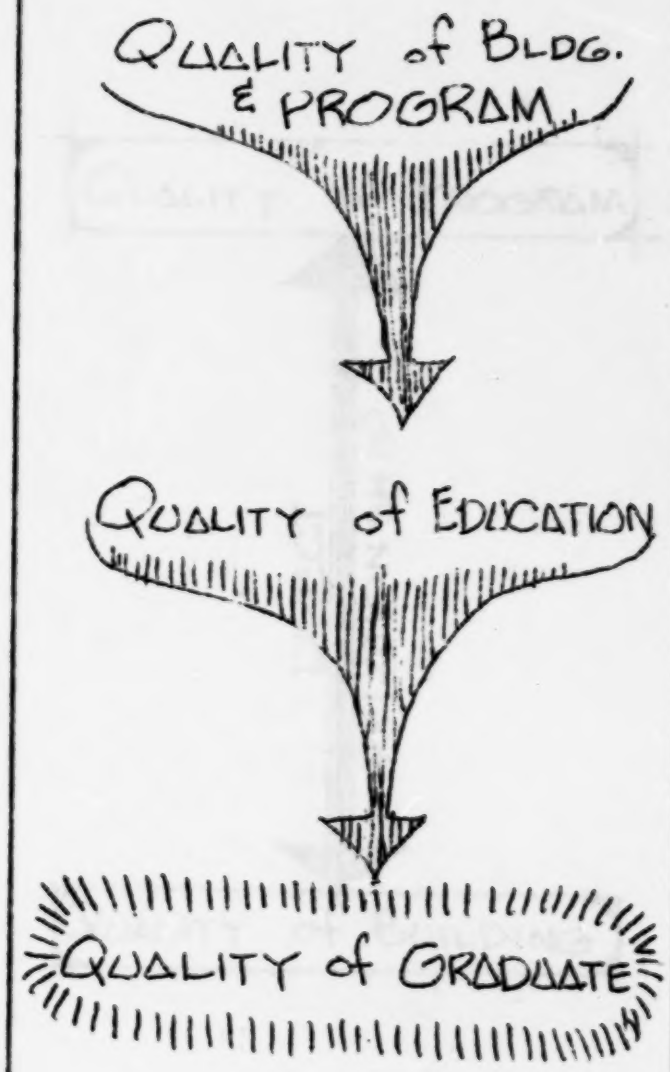
"They tell me a Broadway theatre doesn't have that much space."

"But these are only kids..."

A school can never be "less than" it must always be "more than." This is true of its personnel, of its equipment, of its teaching materials and of its structures. There is no justification in the presumption that students should be taught under unfavorable conditions so that they can "make do" in a deprived situation.

> *Any doctor, any mechanic, any cook, any plumber, any navigator has a right to learn his profession, craft, or trade under the best circumstances possible. With this knowledge the doctor can operate with a pocket knife under the flickering beams of a flashlight but it would hardly be suggested that all of his training should be under those conditions. The home economics instructor does not ask the student to cook on a wood stove, the English teacher does not assign reading in third rate pulp novels because good literature is too expensive. The music students do not conduct all of their rehearsals during lunch hours and present their concerts on a Sunday morning in the local movie house.*

Theatre instruction at the secondary school level must be approached in the same competent, dignified way that other meaningful experiences for the student are

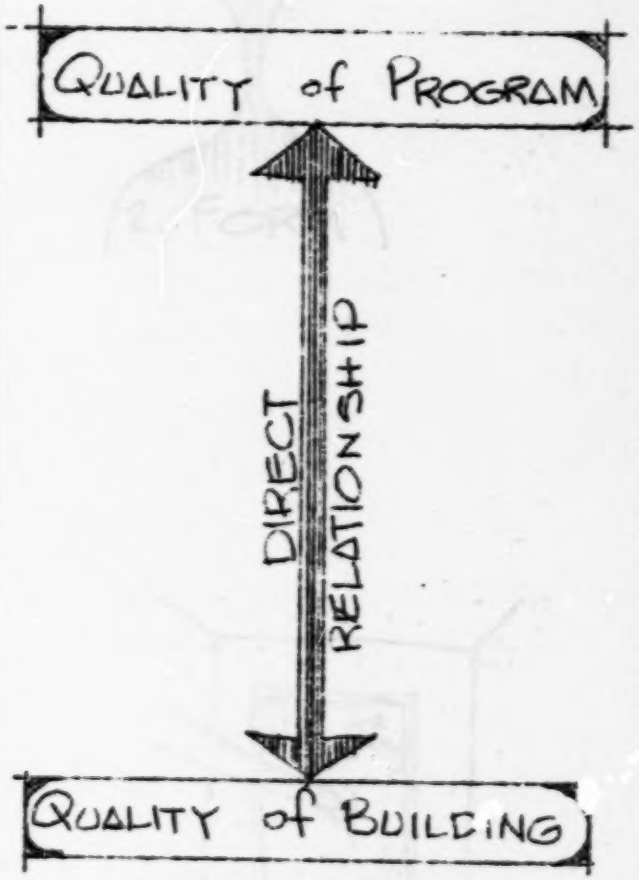


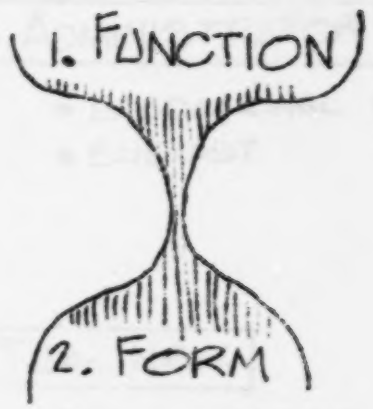
developed.

The TEAM must plan in terms of specific use:

Number and qualification of the staff.
Additional operating personnel, if any.
Number of students to be accommodated in the classroom situation.
Number of students to be accommodated as an extra curricular activity.
Class scheduling pattern.
Nature of student assignments and responsibilities.
Rehearsal methods. Frequency, duration, etc.
Variety of production styles to be accommodated.
Production schedule.
Basic philosophy and priority for outside use.
Standard or measure of excellence in acting, directing, design, costume, etc.
Interrelationship with other school departments, classes, etc.
Numbers of students to be accommodated in auditorium.
Numbers of public to be accommodated in auditorium.
Orientation of various theatre spaces to each other.
Relative sophistication of equipment.
Building specifications.
Privacy.
Auditory and visual isolation.
Floor and wall textures.
Dimensional data.
Electrical services and control.
Plumbing.
Heating, ventilation and air conditioning.
Traffic pattern.
Security.

With a thorough understanding and agreement as to what the structure must provide, it is now feasible to proceed to the specifics of planning.





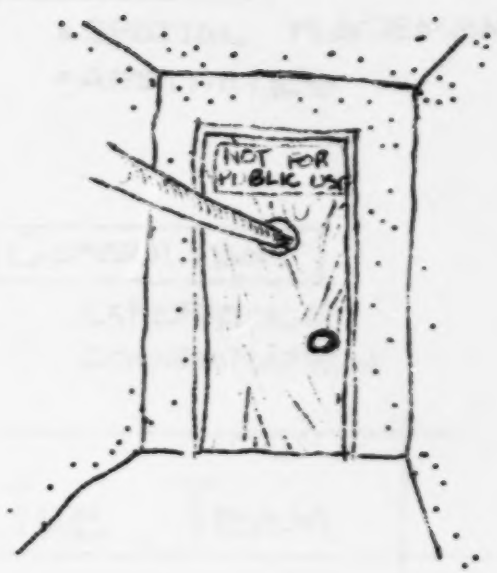
The function of the building having been established, attention can now be given to form. Preliminary plans developed by the architect in conference with the consultant must be checked carefully by teacher and administrator for any evidence of misunderstandings or a drift away from the basic concepts agreed upon. Working relationships between areas and between installations must be constantly checked as the planning develops, otherwise the items are checked off on the check list as supplied, but later turn out to be inoperative. Some mechanical elements such as ducts and heating units are frequently not detailed in the building plans. Unless these space needs are anticipated, they may be installed after the structure is up and seriously impair storage, traffic patterns and the positioning of equipment.

"Yes, I can get it through the door but then there is this pipe in the way."

"We can't stack against this wall because of the radiators."

"Six sets of lines are useless because they are blocked by the speakers and frame for the movie screen."

"The back wall would be fine for projections but there is a vent in the middle of it."



This will not present a problem if all parties are aware that such installations must be provided, but that they cannot be allowed to intrude on carefully pre-planned space. It is not often that these vital elements are left out but they may

be added at such a late date and in such an inconvenient place as to be expensive and hazardous.

> *Let all of the elements of the building grow together including such diverse items as closets, bookcases, sinks, windows, catwalks, bulletin boards, drains and the removable stanchions for the traffic control ropes in the lobby.*

It is the responsibility of the school administrator to establish the educational needs and the financial limitations of the project, of the teacher to establish the requirements and philosophy, of the architect to properly arrange the space, locate the equipment and to house all efficiently and aesthetically. The consultant brings his expertise to bear on all of these problems and serves as a coordinating influence. The consultant may be employed (paid) by the school administration, or by the architect,but seldom if ever by the teacher. However, he must serve all three with equal honesty. He must also remember that he is building their theatre not his. All of the separate agents in the TEAM must be consulted at all stages of development of the plans.

> *All are involved in every change of a wall color, the placement of a skylight, the reduction of ten thousand dollars in the budget allocation, the frosted glass in the green room door, lowering the gridiron, the parking facilities, and the height of the drinking fountain.*

The planning of a theatre is an involved process, and a very educational one. Unfortunately,it is unlikely that any one member of the TEAM will be able to profit

ADMINISTRATOR
- EDUCATIONAL NEEDS
- BUDGET

TEACHER
- PHILOSOPHY
- DIRECTION

ARCHITECT
- SPATIAL PLACEMENT
- AESTHETICS

CONSULTANT
EXPERIENCE
COORDINATION

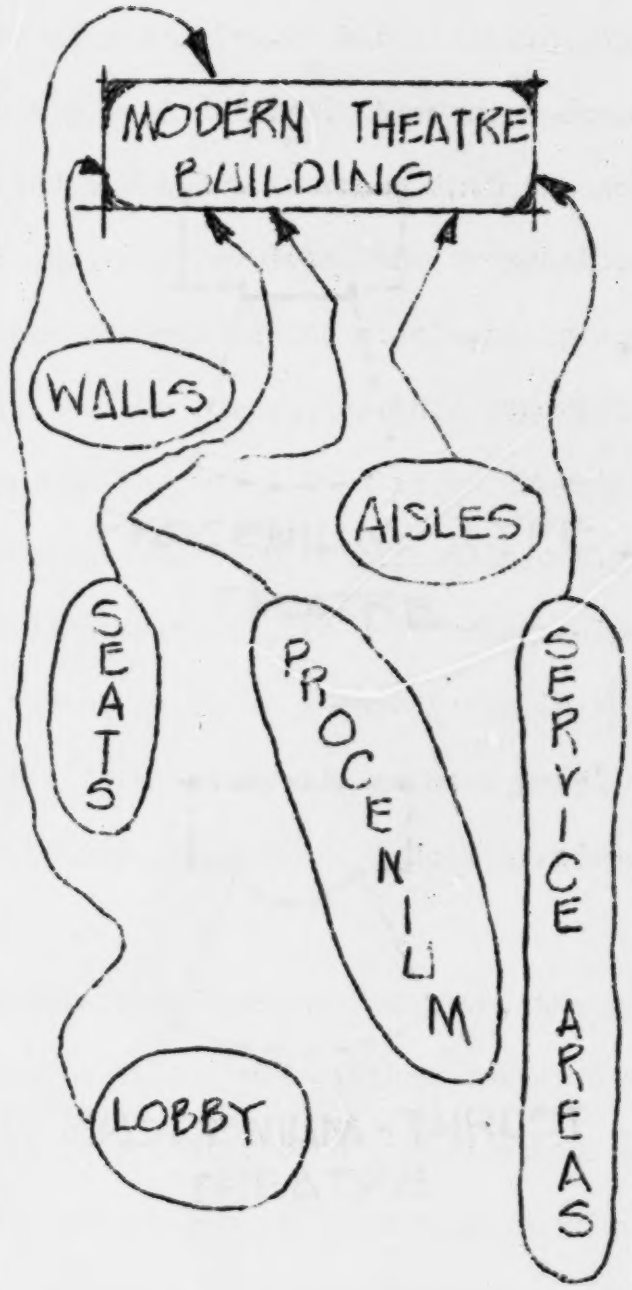
THE TEAM

from that education except the consultant who carries with him as a part of his growing experience all of these multiple exposures.

Chapter II
AUDITORIUM AND STAGE

At one time the term "Auditorium and Stage" had a single connotation and the areas and functions were reasonably well defined. Now there are a wide variety of sizes and shapes to chose from and the stage intrudes into the auditorium, sometimes the aisles disappear, the audience revolves, the prescenium (if there is one) expands and contracts and the once dependable and stable walls now begin to move at the touch of a button. It is not the purpose of this report to detail and make a case for a single theatre form as "the ideal theatre." There is only one ideal theatre and that is the theatre which has been specifically designed, with the assistance of the staff which will operate it, to meet the problems which are unique to that situation. The advice of those knowledgable in theatre structure will help the client to select the form which will be most serviceable and must take into account the problems of site, financing, function, personnel, and operational technique.

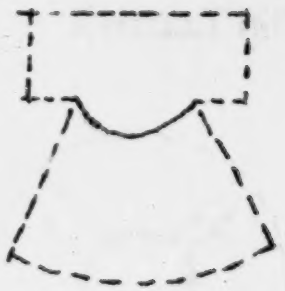
In its discussion of the auditorium form and function, the PANEL specifically refrained from making any concession to the use of this space as a civic auditorium or as a "road show" house. It is true that the secondary school auditorium may be called upon on occasion to serve in such a capacity, but it should not be designed to serve these functions to the detriment of its basic purpose which is educationally



and student oriented. The PANEL admits various advantages in the several more or less standard theatre forms prevalent today: proscenium, proscenium-thrust, platform, thrust (open) and arena. There are other terms which may also be employed to define these. There are some basic forms and many other variants, but most of them are based on the premise that in any one theatrical situation there is usually an area primarily allocated to the performance and another to the observer. For purposes of definition and reference these spaces will be called stage and auditorium.

Analysis of problems should properly start with the auditorium, as, even admitting the primary interest on staging, the theatre's reason for being is its audience in the same sense that the classroom's reason for being is the student. It is perhaps not an oversimplification to conceive of the theatre as an attempt to provide a proper physical environment for the single spectator and the event he has come to see and hear. Some complications develop as this spectator is joined by other spectators and some of this audience is forced to view the production from a greater or lesser distance, from different angles (horizontal and vertical), and with varying degrees of comfort: upholstered and spring filled seating, ample leg room, carpeted floors, heated or cooled air, lounge and rest room facilities. Theoretically the stage has not necessarily changed its size or form as the size

PROCENIUM-TYPE THEATRE

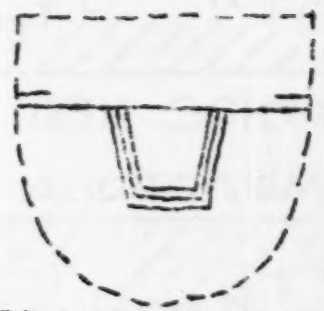


PROCENIUM-THRUST THEATRE

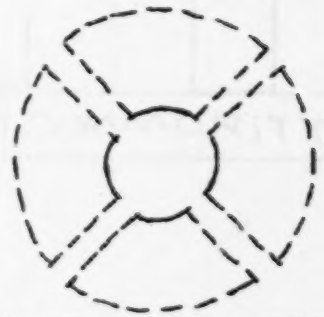
and nature of the audience changes. The problem in designing the auditorium then is the proper accommodation for the single spectator multiplied by the number to be accommodated, which will be dictated by many factors.

Theatrical convention does not demand but usually implies that the single audience member orients himself in one direction and that the other members of the audience are similarly oriented. This uni-directioned audience establishes the position of the stage. There is a unified direction of viewing which contributes to a unified effect. Although well aware of the many advantages of such multi-faceted staging as the arena form or an open stage form, the PANEL is convinced that the most efficient theatre form for the secondary school is that which employs the unified line of viewing or modified proscenium form. The traditional proscenium arch has been severely criticized by some, but the PANEL is convinced that this is due to a misconception of the nature of the proscenium arch and by a slavish subservience to its framing nature. The term <u>proscenium arch</u>, as employed hereinafter, will designate an architectural feature of the building which may be fixed or movable and which does not restrict or confine the limits of the scenic investiture or playing area of the actors. In short, it must be capable of being disregarded. It may be a full or partial arch, it may fall in front of or behind the playing area. Its function is not to contain but to locate, and it provides

PLATFORM-TYPE THEATRE



OPEN THRUST-TYPE THEATRE

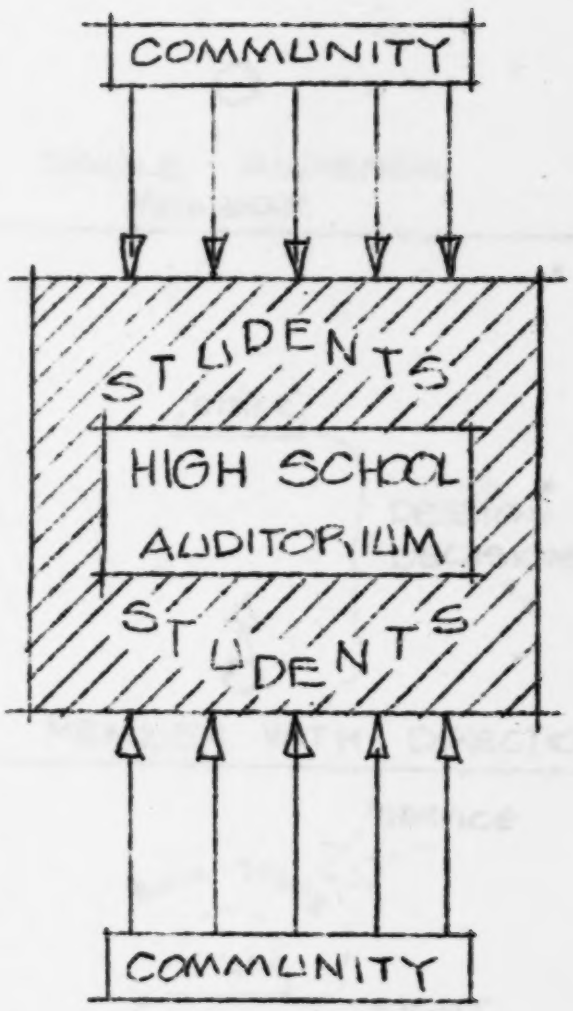


ARENA-TYPE THEATRE

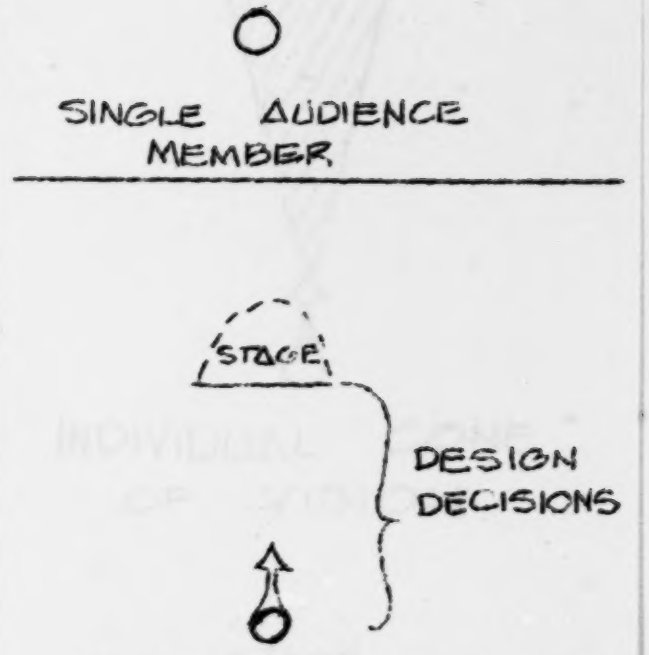
an effective orientation for the single line of viewing mentioned earlier. What delimiting characteristics it has are employed to exclude the extraneous.

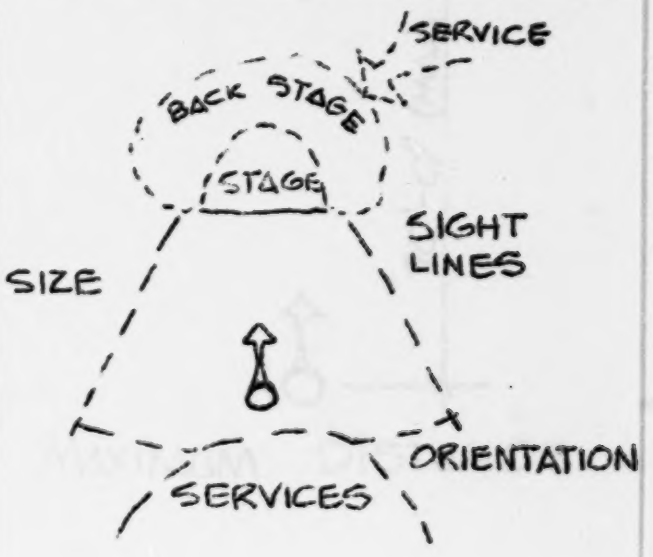
There is a growing conviction on the part of educators, with which the PANEL concurs, that there is little reason to establish the size of the auditorium as an accommodation of the entire student body at one sitting. This is particularly true of the larger schools. Since increasing the size of the auditorium is also not motivated usually by a desire to accommodate more and more people to increase box office income, the size can be established by optimum visibility and audibility standards. Even in those many instances in which the high school auditorium also serves as a community center for public gatherings, there is no justification for providing for such a large audience that they cannot see or hear. Total capacity in such an auditorium will probably be under 1000, and the PANEL's preference was closer to 800.

The one-level auditorium is justifiable in the Secondary School on economical, access and fire safety code considerations alone. However, with seating capacities around 800, a one-level auditorium, with any of the basic space relations determined between audience and performer, will meet vision and acoustical criteria for all performing arts. Artistic purpose would be the only limiting factor. The argument would still be valid up to 1000-1200 capacity considering a space relationship



where the audience encloses the performing space to some degree. Beyond this in relation to artistic purpose, the balcony is perhaps justifiable if such capacities are required. Beyond a consideration of capacity, the one-level auditorium simplifies the problems of vision and sound (balcony would tend to destroy this sense), and simplifies the structural considerations of the architectural enclosure. No spectator's seat should be more than 70' from the stage, the angle of his vision should not be in excess of 30° to the outside of the proscenium, and the vertical angle to the stage should not be in excess of 30°. With these recommended figures as a limitation, those who are inclined to increase the number of spectators are led to reduce the comfort rating of the individual seats by cramping or by extending the seating further around the playing area. There are many economic and artistic reasons for adding seating which tends to further enclose the playing area. Such planning, however, should take into account the different actor-audience relationship which will develop. Within the limitations for optimum visibility and audibility criteria it is important in each particular design that the seating arrangement, with its relation to the stage, be consistent with the artistic purpose. The shape of the auditorium established may vary from the rectangular or box type to the fan shape or a segment of a circle. But, it must be a study in aesthetics - both scale (the proportion of the audience to what they are looking





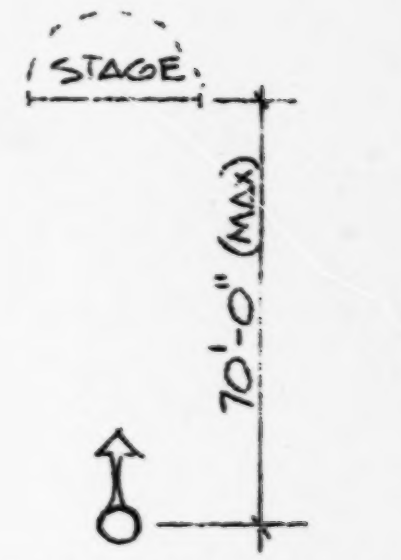
at) and focus. The vertical section of the auditorium is subject to various interpretations also. It is influenced by the inclusion or elimination of the balcony, rake of the floor, volume of the auditorium for acoustical considerations, and lighting and mechanical considerations. There is no justification for the design of an auditorium which does not meet minimum comfort or artistic standards simply because it is designed to house high school students and teachers. Any design or comfort factor which may be employed for commercial or public auditoriums should apply here.

There is no better place to implant in the minds of youth an appreciation of the cultural aspects of life than in an aesthetically conceived, dignified and well appointed auditorium facing a properly equipped stage for the performing arts. High school students are not substandard citizens, and they should not be housed in substandard accommodations. A judicious use of color, texture, a pleasing arrangement of mass and feeling of modest luxury is the best insurance against vandalism and pilferage. Quality breeds respect.

Returning to the concept of the single audience accommodation, the following general specifications should prevail:

Seat: Spring or foam rubber seat, upholstered. Some prefer a non-pile surface on the seat which facilitates sitting and rising. A padded and upholstered seat back both for comfort and for acoustic values. A minimum of 21" width with the possibility of 20" and 22" employed for staggering of the rows.

INDIVIDUAL CONE OF VISION

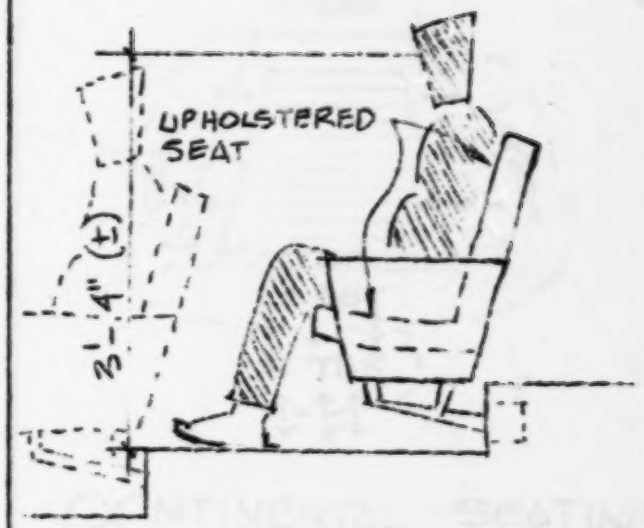


MAXIMUM DISTANCE

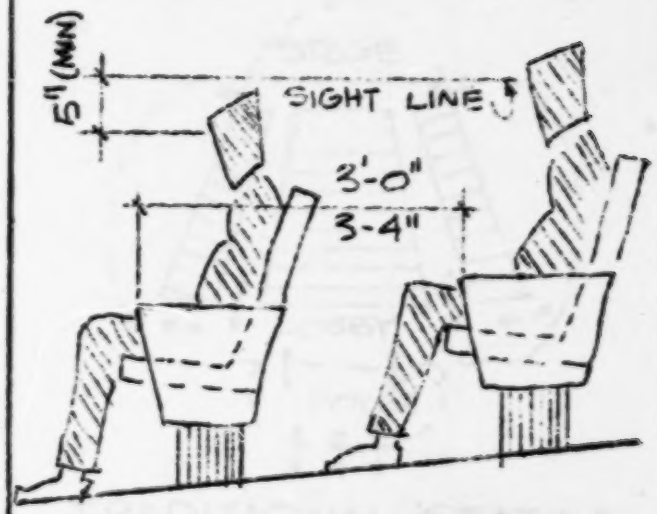
A back to back spacing between rows of at least 36" and up to 40" for a more luxurious feel or for the "continental seating" pattern. Self-raising seats are standard.

Rows: For standard seating building codes usually prohibit more than 15 seats in any one row or, as it is sometimes stated, no more than 7 seats may intervene between any one seat and the nearest aisle. Some states now allow "continental seating," which features unbroken rows from wall to wall, provided there is a demonstrable safety factor in the side exits. There is some disagreement as to whether the continental seating plan is the most efficient use of the space and the most artistically satisfying design. It is doubtful, however, that this type of seating could be unconditionally recommended for the varied type of activity usually housed in the secondary school auditorium. If the auditorium is wide, it is highly desirable to curve the rows for either continental or standard seating.

Floor: The floor must be terraced or inclined to provide optimum sight lines for each row. Terracing is generally preferred. The best results can be achieved with a dished floor, but this will add considerably to the cost. Even with staggered seating there must be a minimum of 5" differential in



SELF-RISING SEAT
TERRACED FLOOR



DISHED FLOOR

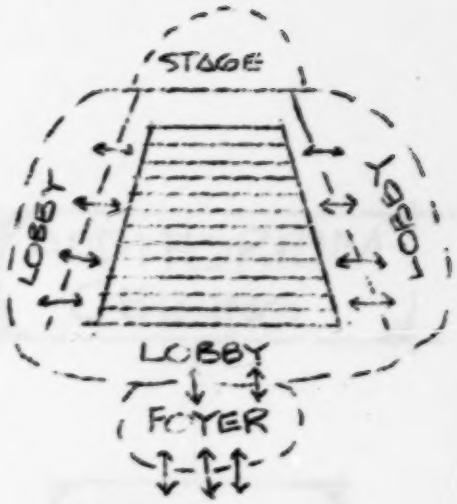
vertical elevation between rows.

A carpeted floor is desirable because of its acoustical values, both sound absorption and eliminating disturbing traffic sounds. It is also economically feasible when cleaning and maintenance costs are taken into account. The added comfort and sense of well-being imparted by carpeting makes it a good investment. A good commercial wool, acrylic or nylon non-tufted carpet woven through the back, with a separate pad should be used on aisles and approaches. A concrete floor with a hardener is sufficient for under seating. Broadloom carpet, as it comes in wide widths, is more economical if required.

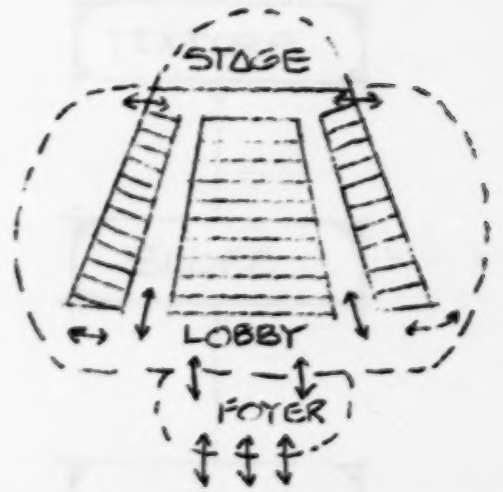
Aisles: The minimum width of aisles is established by local building ordinances and depends upon the number of seats served. Basic requirements vary from about 36" at the point furthest from the exit to about 54" at the point nearest the exit. The use of aisle lights is recommended.

Both row letters and seat numbers should be clearly marked and capable of being read without confusion by the general public. Arm marking is generally unsatisfactory for either row or seat because they are small and frequently covered by seated patrons.

There are many variations on the typical floor plan described above. The basic principles may be used as guide lines for various floor plans, orchestra,



CONTINENTAL SEATING



TRADITIONAL SEATING

balcony, loge, etc.

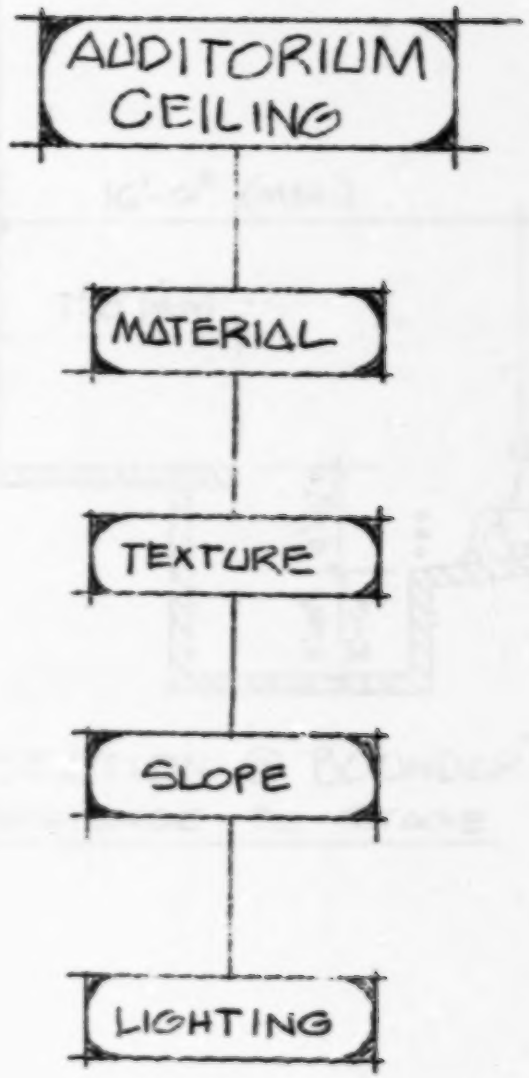
The auditorium space should be separated from the public service areas by light-proof and sound-proof doors.

The ceiling, ceiling material, texture and slope will be dictated first by acoustical criteria and then by auditorium lighting, theatrical lighting and mechanical systems distribution. A variety of materials will satisfy these requirements.

Auditorium Lighting: The auditorium lighting must be an integral part of the ceiling design. Generally, a recessed architectural down-light will do this best. The fixture design and arrangement should avoid spill on walls. The acoustical factors in the design of the room will be discussed under that heading, and such lighting ports as are a part of the ceiling or wall planning will be detailed in the description of the stage. Now that the audience has been accommodated the stage can be defined next.

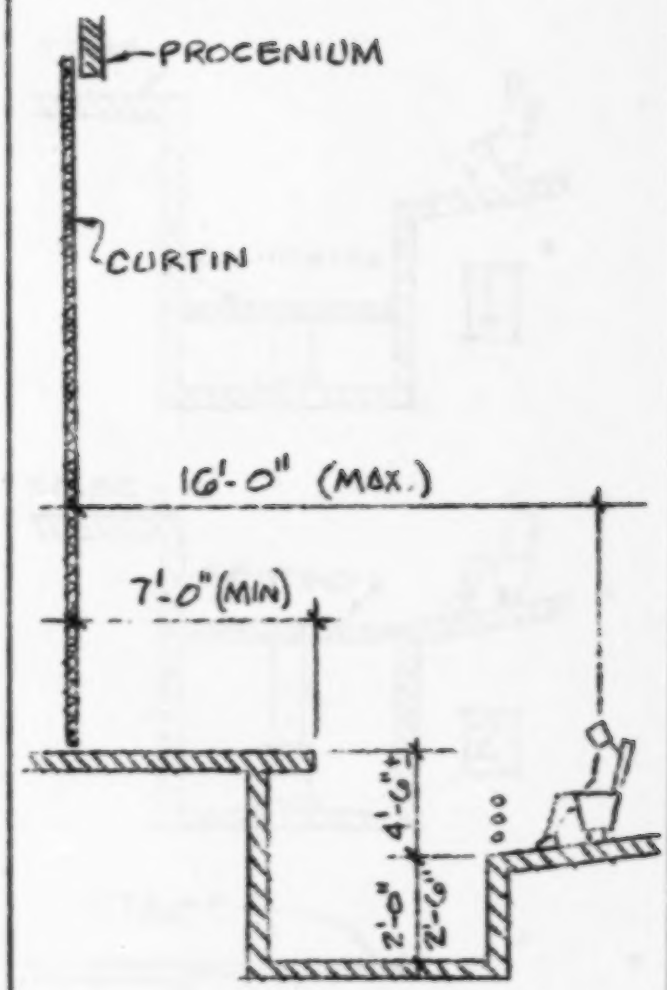
THE STAGE

Regardless of its form the stage normally has some kind of physical or psychical separation from the audience. This is usually achieved by a combination of one or more elements such as the proscenium arch, an elevation, or barrier. The fact that the elevated stage may have flights of steps leading up to it



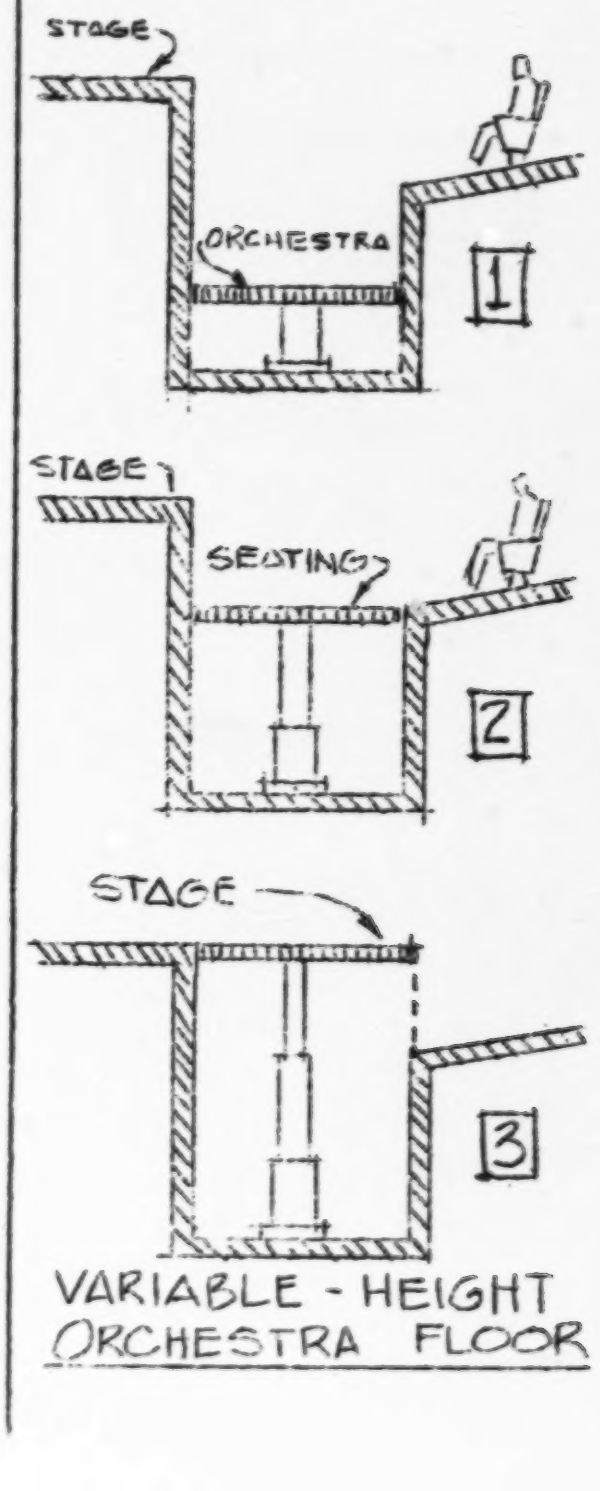
apparently does not destroy this separation, and is frequently employed in the thrust type of staging. There is no fixed dimensional data that can be recommended for the thrust or forestage. In some cases it is a long penninsula protruding well into the audience area and bringing the action closer to all parts of the auditorium. This projection may be symmetrical or asymmetrical but it should have a minimum width of 12' to be useful. The typical forestage or apron usually runs the full width of the playing area or the width of the arch in the proscenium theatre. Some of its usefulness depends upon the exposed area when the house curtain is closed, and this should be a minimum of 7'. Whether it is curved or straight line is determined primarily by the way in which it will be used. Another treatment of this vital area where auditorium meets stage is the side stage, usually produced by the intrusion of the audience area into stage space, forcing a kind of "wrap around" effect. These areas may be partially exposed, completely exposed, or completely concealed. They are employed as auxiliary playing areas, and it is doubtful if they should be allowed to extend past more than the first row or two of the audience, as those members of the audience would become more and more disadvantaged as they lose their unified viewing position.

The high school stage should be serviced by an orchestra pit usually running the width of the exposed stage or proscenium arch. A very large orchestra pit



SECTION @ BOUNDARY:
AUDIENCE to STAGE

opening is a disadvantage, as in a production it places too great a separation between the front rows of the theatre and the curtain lines, or front boundary, of the acting area. This distance should not exceed 16'. Figuring a minimum of 16 sq. feet for each instrument (including upright piano) the high school orchestra pit is necessarily pushed back under the stage to provide space. An orchestra of about sixteen pieces can be accommodated in front of the stage, but considerably larger groups are often employed in high school and they cannot be allowed to enlarge the separation between audience and stage. No great depth in the pit is necessary. 24" to 36" below the auditorium floor, which is in turn about 54" below the stage floor, will provide effective coverage for all seated musicians. The bass players at the extreme ends of the pit will be within the vision of very few people, and the standing conductor, even on a dias, has only his head showing above the stage level. The pit must be surrounded by a guard rail, and usually by an opaque covering as well, so that the audience is not distracted by the lights and movement in the pit. There are some advantages to having the pit accessible from below the stage, as this provides easy entrance and exit and storage potential. A variable height orchestra floor (elevator) which may be raised or lowered at will makes this space much more versatile. It can be in one or more sections and the multiple sections can be synchronized for simultaneous movement. In the lowest position the platform serves as a floor for the orchestra pit. At auditorium



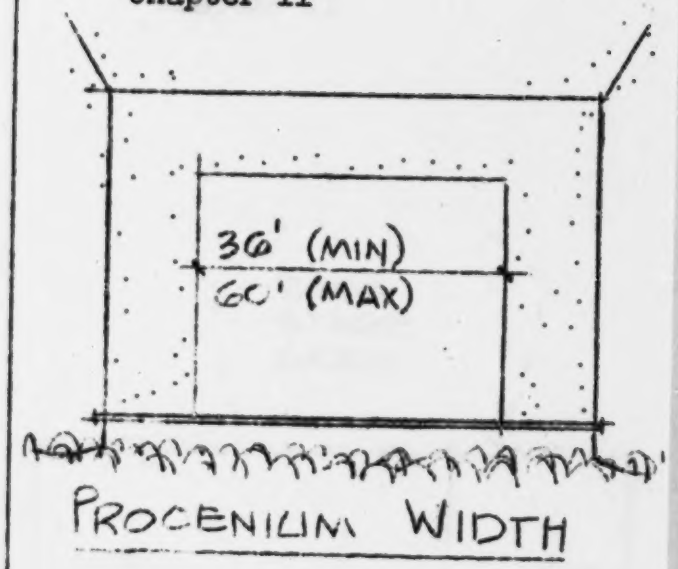
floor level it may be used as a seating area, at stage level as an extension of the stage, and at any of the intermediate positions it can serve as a terraced or level playing area. For theatres designed with storage space below the stage, the elevator can also be employed as a freight elevator in raising or lowering materials and equipment such as scenic units, furniture, or a piano.

Building codes in many states have now been revised to eliminate the unsightly and costly guard rails around such an elevator orchestra floor. The automatic cut off switch which prevents the downward or upward movement if the elevator encounters an obstruction is usually considered an ample safety device. If a deeper pit is employed for any reason, some provision should probably be made for portable guard rails which can be installed when the public is not in the house. The presence of a pit near such an active area as a stage is a hazard, but safety devices around the pit will protect this very valuable theatrical accessory. Considering the wide variety of demands made by the different styles of production, it is not always possible to predict in any one structure where the auditorium seating will stop and the stage function begin. To provide some flexibility at this important physical juncture it is desirable to have the first two or three rows of seating mounted on templates. With such mounting it is possible to remove entire seating sections (and replace them) in a very short time. If the forestage needs to be extended beyond the orchestra areas, it is relatively simple to remove the seating

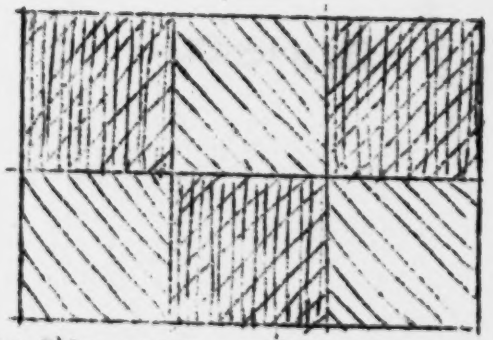
which is in the way. If a larger orchestra is desired than the pit can accommodate, additional instruments can be accommodated in such a cleared section.

THE PROSCENIUM ARCH

The PANEL strongly recommends an expandable and contractable proscenium. This need not be an elaborate or expensive mechanical device. Simple rigid and sectioned panels operating on a track system will provide an effective method of increasing or decreasing the width of the proscenium opening. If these panels are properly surfaced they will blend into the wall treatment of the auditorium and preserve the architectural identity of the area. The overhead limitation may be accomplished by a header, matching panel operating on the rigging system of the theatre or by the usual fabric valance. The PANEL agrees that the minimum opening (permanent or flexible) should be 36' wide and that the maximum opening should be 60' wide with a preference for 45'-50' for other than the flexible proscenium structure. It is conceivable that a larger opening might at some time be desirable, but the difficulty of working with this potential in all other cases would suggest holding the building plan to the above figure. For aesthetic reasons, the height of the proscenium frame should be related to the width, and the ratio most often employed in contemporary design is approximately 2 to 3, or the height estimated as two-thirds of the width. This ratio will not prevail for a very wide opening for obvious reasons. The height of the proscenium arch is not a matter of major concern



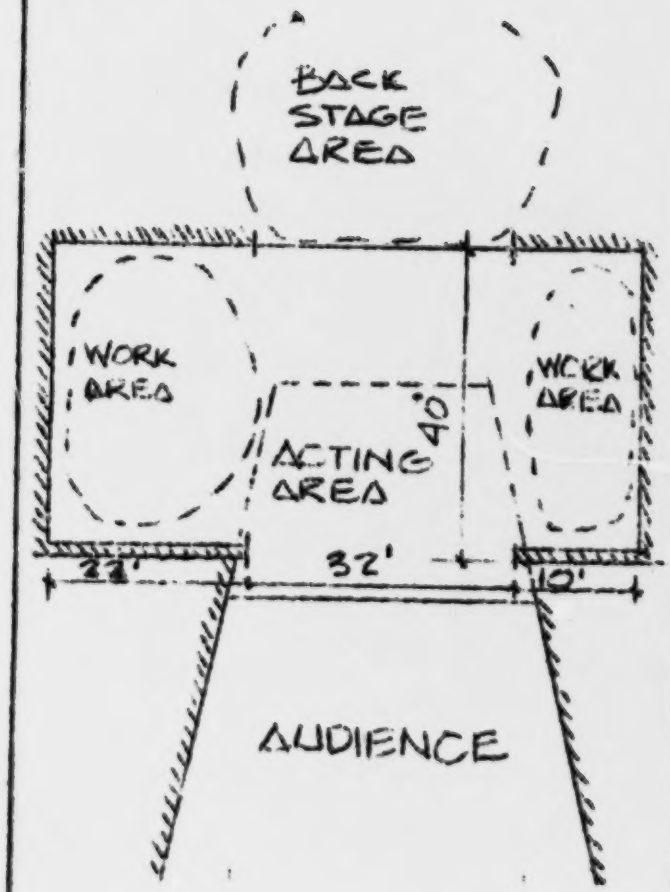
PROCENIUM WIDTH


STANDARD PROCENIUM
RATIO: 3 → 2

in design, but for staging reasons it should probably not be below 18'.

The offstage needs of a stage are often underestimated. There should be space offstage to the right and the left equal to the width of the proscenium, as a minimum. There are some strong arguments for unbalancing this space if it is at a premium. A 32' proscenium which has 16' to the right and to the left does not provide the essential space for storage and manipulation which must be present on one side, if not both sides, of the efficient stage. The depth of the stage bears no particular reference to its other dimensions. At the most, not more than 25' or 30' will be used for a playing area (including musical or dance attractions). An additional 15' will provide space for scenery, lighting instruments and cross over, so there is little need for a stage of over 40' in depth for a secondary school structure. If the back of the stage is common wall with some other theatre unit such as a shop, additional depth can be provided by creating a large door, recommended to be of at least proscenium dimension, opening into this area. For those rare occasions when extra depth is required, this lift door can be opened and that floor space added to the stage.

The stage floor, especially the playing area and the space immediately surrounding it, should be of soft wood. Because of the heavy traffic on the stage, the floor should be of 2" tongue and groove decking rather than 1" flooring over a subfloor. The 2" material will take repeated sandings to bring it back to shape,



while the 1" flooring may not take more than one. It should be remembered that a stage floor is created to stand heavy usage and no attempt should be made to give it a hard varnish or plastic coating to preserve it or to reduce the maintenance problems. Such a surface will only inhibit its use. A deeply impregnating stain, the darker in color the better, is the best wood treatment. As an added protection, some designers recommend topping the floor with masonite or with linoleum. This provides a good working surface, free of breaks and changes in color, and, if properly laid, will hold up well even under heavy castered loads.

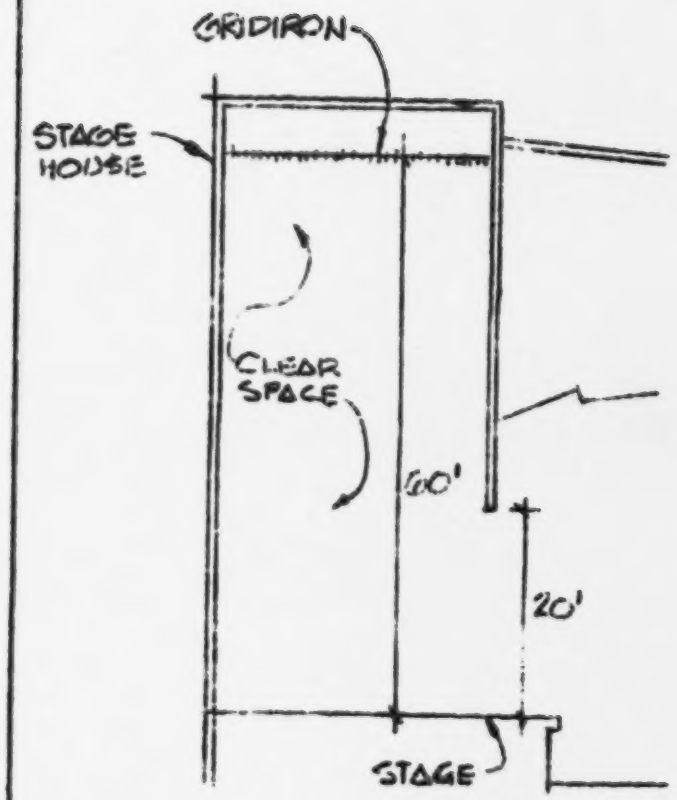
Some consideration should be given to the need for stage traps. Some of the PANEL were of the opinion that this type of floor was not necessary in a secondary school structure. Others pointed out that it is not an expensive installation, and, if properly constructed, some of the usual difficulties such as splintering edges and "trap rumble" can be eliminated. The use of traps requires a full 8' open area under the stage. The optimum condition is to have the entire playing area trapped, but if a fewer number are desired they may be placed in the areas indicated in the accompanying drawing which suggest the heaviest trap usage. The size of the traps can be varied to adjust to the floor joists, but a trap width of 4' is preferred. The length of the trap is usually 4', 6' or 8'. Traps of a larger size are difficult to handle.

STAGE HOUSE

The PANEL agreed that scenic movement and storage could be handled by lateral movement at stage level, but they also agreed that vertical movement was definitely preferred.

"We have yet to devise any means of scenic movement which is as reliable, fast and silent as hoisting."

It is not necessary to provide loft space over the entire stage floor. Only the space immediately above the areas involved in scenic placement plus adequate offstage side clearance will be employed for vertical movement. Any material which is lowered and then moved to another location had best be stored on the same level on which it works in the first place. The loft space, then, should cover the entire depth of the stage and 16' to each side of the proscenium arch in order to accommodate stage setttings, backings, lighting instruments, etc. The height of the gridiron should be three times the working height of the trimmed opening (two and one half times is an absolute minimum). If a 30' proscenium arch is invariably trimmed to 20' in height, the stage can operate efficiently with a gridiron 60' in the clear from the floor. This 60' must be completely free of obstruction on side walls, the proscenium wall, back wall and underside of the gridiron. The rigging of the stage will be described under the heading of Equipment. A fly gallery will probably be needed, and if the planning of the theatre allows,



one on each side will be an advantage. It is doubtful if a matching gallery along the back wall will have as many advantages as it will disadvantages. Such a plain, unbroken wall, particularly if it has a matte surface for lighting or projection, is frequently useful. The height of the fly gallery is usually about 20'-24' above the stage floor. It should be well above movement height or stacking height of scenic units. There should be a number of personnel doors into the stage area as the unpredictable nature of the scenic distribution may create traffic problems. The Stage Manager's position should be on that side of the stage nearest the operating controls such as house curtain, lighting controls, rigging operation, intercommunication. There is no basis for a particular preference as to right or left operation except the location of the services listed above.

The flexible and changeable elements related to the production and control of light and sound will be discussed under the heading of Equipment. However, some architectural provisions must be made for these functions and they should be outlined here. Some expert opinion holds that the usefulness of the footlights is past with new lighting developments. Others insist that they are a good supplementary source, and, although it is not necessary to invest in a permanent installation, that there should be a trough near the lip of the stage designed to accommodate either strip lights or special instruments. This trough should be serviced with its own electrical outlets and should have a solid cover, either

hinged or removable, that will provide a smooth working surface over the trough when it is not open. Although cyclorama footlights are sometimes provided in a more sophisticated staging plan, it is presumed they will not be particularly useful here. Most of the architectural provisions must be made in the auditorium itself. Slots or fins in the side walls of the auditorium near the stage are useful as concealed positions for lighting. Such side ports provide a light mounting position for right or left and from any level from stage floor to ceiling. Two or three such lighting positions on each side of the auditorium, and within 20' of the stage, will be very useful. If side stages are incorporated into the stage design, these same ports or fins can open to these areas and serve not only for lighting but for personnel entrance. Similar lighting positions, two or three in number, must be provided in the ceiling of the auditorium. These openings should run the full width of the house and be readily accessible from above by a system of walkways. Ample room must be provided for projection from these beam positions and the work areas should be comfortable. An overhanging port, as shown in the illustration, is the most efficient opening, but can be dangerous for workers, or for patrons in the audience below if tools, gelatine frames, cracked lenses or complete instruments drop from above. Wire mesh screens may be installed as a protection against such accidents. The difficulties caused by reflection or refraction of the light beams passing through such a screen are

negligible, particularly if the screens are painted with lamp black.

The ceiling should be sealed, and heavy guard rails should be provided for all catwalks, as under typical performance and rehearsal conditions this area can be hazardous.

An opening of two to three feet in height is desirable, as a narrow beam slot makes directional focusing difficult. Manually operated follow spots can be mounted in these positions also.

With these beam ports open, roof noise is readily transmitted to the auditorium. This can be minimized by glazing all ports, or providing sound proof covers for the unused ports. The best solution is an acoustical treatment to the underside of the roof. Concrete slab roofs eliminate most of this difficulty. Lighting and sound control are recommended to be handled from rooms at the back of the auditorium where the operators evaluate the effects from an audience position. If architecturally feasible, a full band of such rooms can be supplied in the back of the auditorium at the next floor level above the audience. The central room is reserved for lighting control and for the use of projection equipment. It is presumed that if the room is used for motion picture projection the equipment will be 16mm and employing nonflamable film. Such a room usually need not satisfy the code requirements for a projection room. The center ports will be used for motion picture projection and viewing. Larger double glazed windows to one side of the room will provide the switchboard control operator a

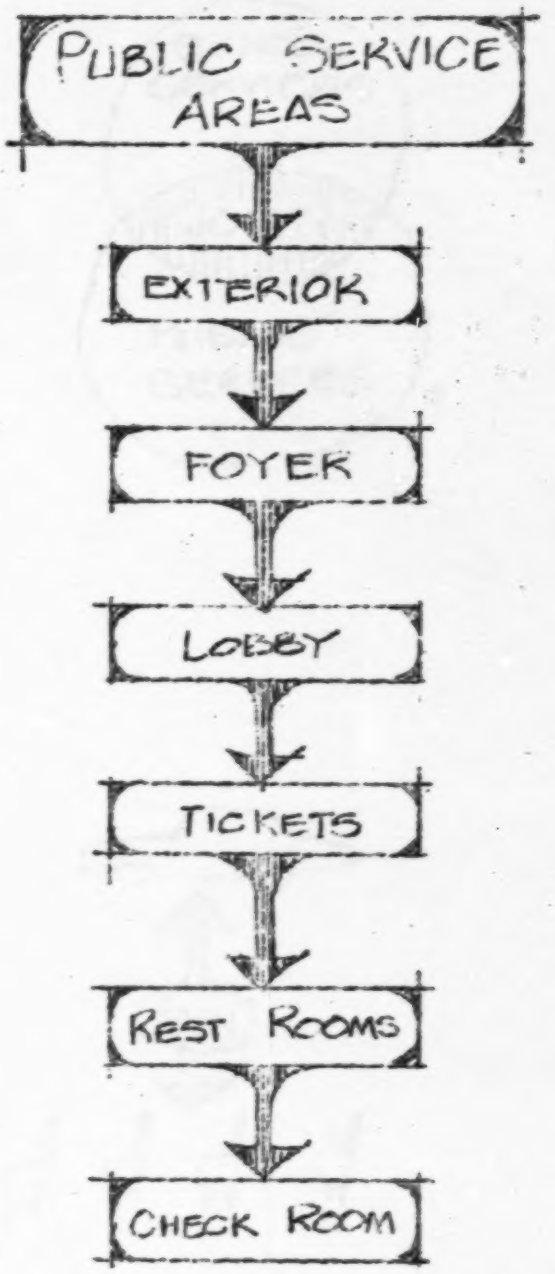
full view of the stage. (See Equipment.) A second room (or a part of the light control room, if acoustically insulated from the other functions) will be used for sound control. Here the sound operator will watch the production from his viewing window and supply the necessary sound effects with electronic equipment (see Equipment). There should be an arrangement by which he can open his window in order that particularly subtle sound effects may be monitored by ear from the source. A third room, with full viewing windows and a series of tiered seats, may be used as a viewing room. It is designed to provide space where an instructor and other students may view the play in progress, and make comments, without interfering with the production as the audible element of the performance comes to them through speakers. Such a room can also serve as additional emergency seating during performance, and during the day, with viewing windows curtained, it can be used as a classroom. All of these must be acoustically isolated from the auditorium and from each other. All ports and viewing windows must give an unobstructed view of the entire staging area.

Chapter III
THE PUBLIC SERVICE AREAS

Any kind of theatre installation must, of necessity, serve the public. The degree to which this service is rendered or the type of service will depend, in part, upon the relationship existing between the producing organization and the audience. This may extend from the simple amenities to a sense of elegance and excitement which makes theatre going, regardless of the level of performance, an event. When employed as a congregating place for the general public, the secondary school auditorium or teaching station must, in itself, inspire confidence and produce a high level of expectation. Because the school is not a theatre, some of the school accommodations may be utilized as public service areas. This is a reasonable solution, but the school cannot invite the public to the building and then refuse or fail to produce normal public services under the excuse "this is not a theatre." The public service areas are easily defined and specified. The changes which may be allowed in these specifications in order to combine usage with other academically oriented space have to be determined as a matter of policy and of fact in the custom design of each installation.

OUTSIDE PUBLIC SERVICE FEATURES

Identify the auditorium and its entrances for ready location by day and by night. An illuminated sign, separate from the building, is a wise investment.

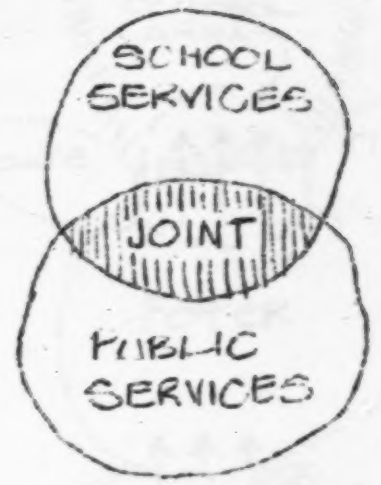


Automobile traffic should be controlled so that arriving cars use one approach and departing or parking cars another. If possible this approach should allow patrons to be discharged very close to the entrance, and it is highly desirable to have this under a canopy which provides cover all the way to the foyer or lobby. The auditorium is a public area and some consideration should be given the public in establishing its location.

> *A frequent pattern requires the theatre patron to park on some of the streets adjacent to the school, walk to the school, then take a long walk up to the front door, then down a long corridor to another part of the building (frequently unmarked) before finding the auditorium. This is the habitual path of the student; the public deserves some additional consideration.*

After discharging passengers, the car driver should be able to continue directly to a parking lot reserved for theatre patrons. If another event at the school starts an hour earlier, theatre patrons may find there is no space left for them. Parking stalls should be clearly marked and the parking area lighted for the convenience and safety of the public as well as a protection against thievery and vandalism. Provide one-third to one-fourth as many car spaces as there are seats in the largest theatre facility, unless the travel habits of the local patrons recommend to the contrary.

> *Theatre patrons, all one thousand of them, do everything at the same time: they park at the same time, they arrive at the door at*



the same time, they pick up their tickets at the same time, and there is equal simultaneity in the moment they check their coats, visit the drinking fountain, utilize the rest rooms, and then depart the theatre. These one thousand people do all of the same things any other one thousand people will do, but they do them at the same time. This is the major problem in planning the public service areas of the theatre.

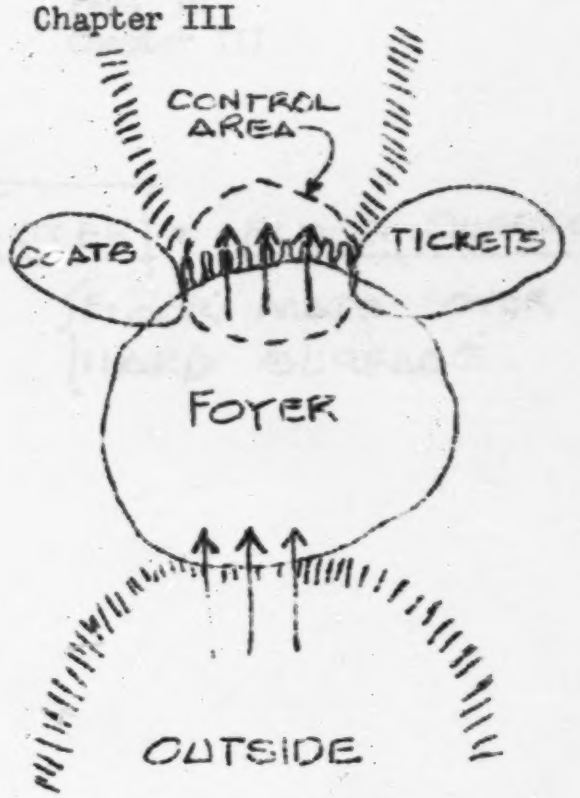
Since all of the patrons will arrive simultaneously, it is highly desirable to provide a marquee for their comfort and protection as they wait until they can get in the door. If there is more than one major door through which the public can enter, a traffic divider or some other device must be employed to distribute the arriving audience; otherwise they will all stand in the ticket line rather than using the other doors, which are equally available.

AUDIENCE ENTRANCE

The theatre patron arrives from a "free" area and passes through "free" doors providing ready access to the foyer or lobby of the building. No personnel service is performed for the patron outside the theatre.

THE FOYER

A separate foyer is recommended, but this function is sometimes coupled with that of the lobby. One or more ticket windows must open into the foyer. These windows should be at some distance from the lobby doors so that ticket buyers will not obstruct the entrance of those who have already purchased their tickets. If a



$F_{FOYER} = 1$ SQ. FT / SEAT (MINIMUM)

checkroom is provided it may open to the foyer, but there is no objection to it also opening on the lobby. Garments may than be checked before or after submitting the ticket. The foyer should be well heated and well lighted. Floor mats on composition or other hard surface floors are to be preferred over carpeting, as this area gets very hard usage. The size of foyer should be approximately one square foot per seat in the auditorium. Although many doors may be provided from the foyer to the lobby for intermission and exit use, they should be capable of being closed at entrance time so that one or two only may be used as a traffic control for ticket taking.

FOYER • FLOOR SURFACE
{FLOOR MATS OVER HARD SURFACE

THE LOBBY (Lounge)

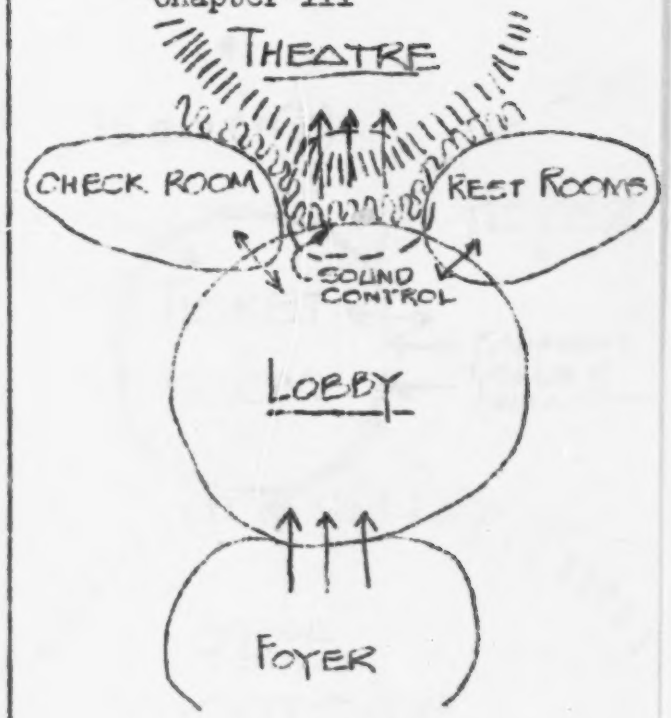
The lobby is more spacious than the foyer, or outer lobby, and its accommodations are more subtle. If carpeting is employed in any part of the theatre structure it will be used here. It is cheaper to maintain a good grade of carpet than most finished hard floors, with the exception of terrazzo. The ticket office may open into this lobby, as do the rest rooms, checkrooms, auditorium doors, and stairways or ramps to other parts of the building. If there is a balcony in the theatre, a lobby should be provided for that level also. The lobby should be relatively large, even if it necessitates some kind of joint or common use with a corridor. There is an increasing tendency to wrap the lobby around the auditorium,

LOBBY • FLOOR SURFACE
{CARPET (HIGH QUALITY)

thus providing more space, a greater safety factor, added sound isolation, as well as a gracious intermission area (which can also be utilized for other social events or academic functions such as exhibits for art work, club rooms, teachers lounge, etc.). In this analysis of the lobby it is presumed that the lounge function in the secondary school will be accommodated in the lobby. Two square feet per seat in the auditorium is a conservative estimate, and up to 6 sq. feet can be justified. Comfortable but sturdy furniture can be used in a secondary school lobby if traffic in this section is restricted during the academic day.

THE TICKET OFFICE

The ticket office usually has a personnel door opening into the lobby. This door might be a dutch door and it could also be used for serving the public. The major business transactions are conducted at the ticket windows. If it is desirable to keep the main part of the theatre locked during some business hours, there should be a window opening to the outside so that the ticket selling function can be performed without the customer having to enter the building. A protective grill is preferred over the window with ticket and voice port. The opening should be relatively small as a protective measure and to produce privacy in the ticket office. Each window should be provided with some type of solid or opaque closure when the office is not open for business. Two windows opening into the foyer should

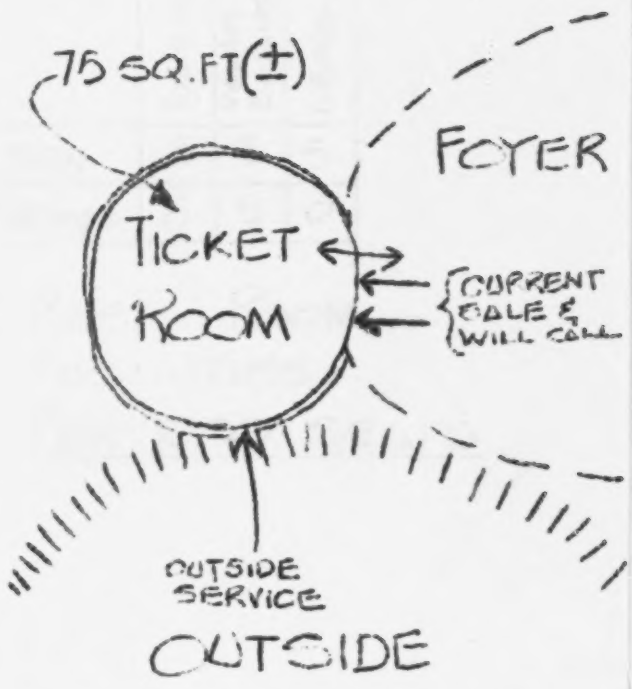


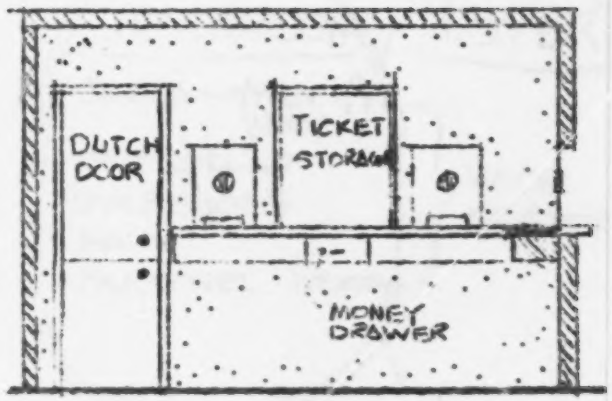
LOBBY = { 2 SQ.FT/SEAT (MIN.) ; 6 SQ.FT/SEAT (GOOD) }

be able to accommodate advance sale, current sale and "will call." These windows are usually placed close together with the ticket racks between them so that, when necessary, two lines of patrons may be serviced from the same ticket storage. Telephone service should also be available at this same counter so that one ticket selling position can accommodate any type of sale; a cashier drawer is immediately available to the seller. As a precaution, it is best to arrange both the ticket racks and the cash drawer so that they cannot be reached from outside the room. Unless the ticket office is also to serve as a business office, or some other function, a small room will suffice. Seventy-five sq. feet, arranged as a rectangular space with the long side as the service area, will accommodate three windows. Some theatres are now experimenting with the "ticket bar." This is a kind of auxiliary ticket service counter which can be rolled out of the ticket office, or storage room, into the lobby or foyer area. There seems little advantage in this system for the secondary school theatre, as the ticket office still has to be maintained for telephone, storage, private office function, etc. The ticket bar also presents security problems which may be more acute in this type of theatre.

REST ROOMS

One large rest room should be provided for men and a powder room for





ELEVATION @ TICKET WINDOW WALL

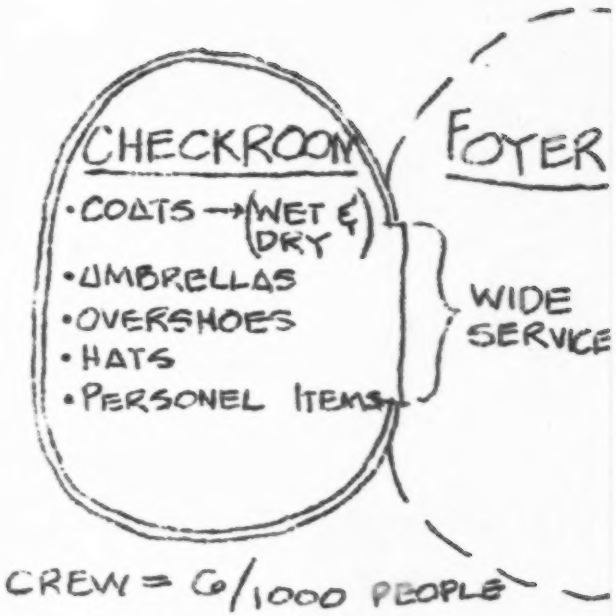
women. The latter will have to be the more spacious of the two. It is not usually desirable to have these rest rooms serve the student needs during the day. The lavatories should have anterooms, and it may be desirable to carpet these rooms. The lavatory area should have tile or similar sanitary floor and wall surfacing. The men's lavatory should have 5 urinals, 3 toilets and 3 wash basins per 1000 seats in the auditorium. 8 toilets and 5 washbasins per 1000 seats in the auditorium is minimum for the women's lavatory.

	TOILETS	WASH BASINS	URINALS
MEN	3	3	5
WOMEN	8	5	0

REST ROOM FACILITIES PER 1000 SEATS

CHECKROOM

The checkroom should open into the lobby, but it may also open into the foyer. Wide service bars should be provided rather than small window or dutch door openings. Checking space should be provided for hanging garments, shelves for hats, racks for overshoes and bins for personal belongings. The service bars should be located well away from the outside doors to avoid congestion. A crew of six will be able to handle an incoming audience of 1000. It may be desirable to increase the size of the crew for the departing audience. The size of the room is dictated largely by the number of people working in it, rather than its storage capacity. If desired the space described can also be used as a self service check room with or without the protective device of coin operated hangers or lockers.



MISCELLANEOUS SERVICE FUNCTIONS

Drinking fountains must be provided in the lobby, and additional fountains may be provided in the anterooms to the lavatories. Total service should equal 1 fountain for each 200 seats in the auditorium.

Public telephone or telephones should be available in the lobby. These should be in recessed booths, and it may be desirable to have these rooms locked except when the building is open to the public.

Local building codes specify the number and size of exit doors (usually one 5' door to each 300 people). Emergency lighting service should be provided in all public service areas including the auditoriums.

In general, the specifications outlined above will apply equally to any type of secondary school theatre form, including the theatre teaching station. The nature and size of the audience anticipated in each of the various theatres may suggest some change in the public service accommodations.

DRINKING FOUNTAIN = 1/200 SEATS

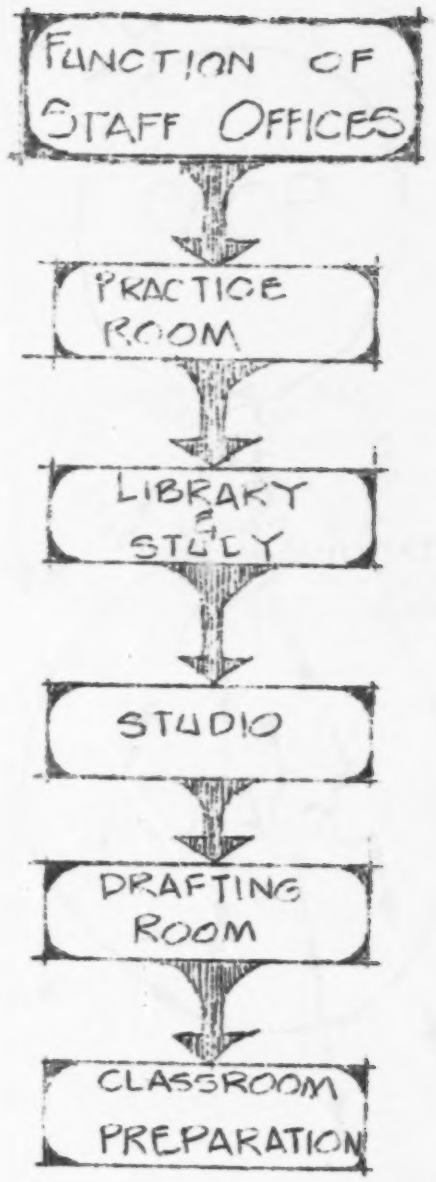
EXIT DOORS = $\frac{1(5'\text{WIDE})}{300\ \text{SEATS}}$

Chapter IV
BACKSTAGE WORK AREAS

Some of the backstage service areas are more important than others and the relative size, shape and position will vary with individual usage. The PANEL has elected to supply information for all of them, and to insist that each has a well integrated and defensible position in planning of theatre accommodations in the secondary school.For illustration, some teachers request their performers to apply their own make-up in their own dressing room. Other teachers ask the performer to leave the dressing room and come to a make-up room where the make-up is applied for them. Two separate design solutions are suggested here, and this report will not attempt to resolve the problem by recommending one procedure as opposed to the other. The following areas are standard in secondary school theatre, and all should be incorporated in the plans for an efficient building.

STAFF OFFICES

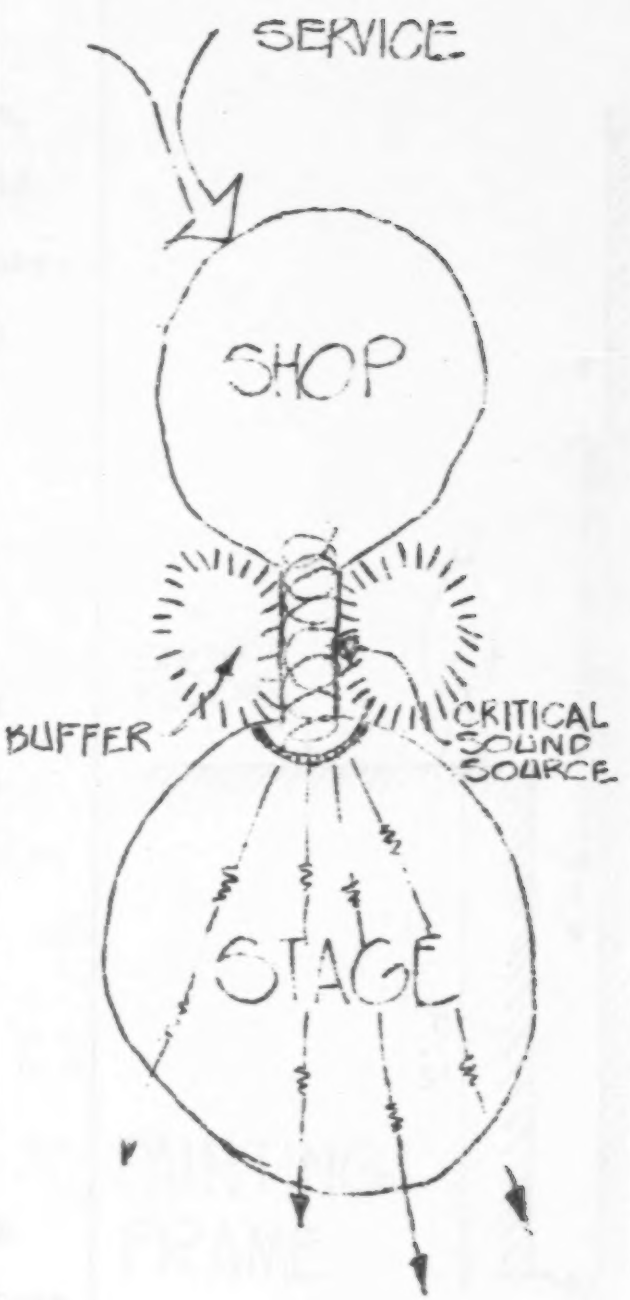
There should be a separate and private office for each member of the theatre staff. Such a teacher does a considerable amount of his or her teaching in the office and it frequently becomes practice room, library, or drafting room, and privacy is important. If it is to serve as the drafting studio for a designer, it will need to be large enough to accommodate the tools of his trade. Otherwise an office with space and appointments equal to that of other private instructional



offices will serve.

THEATRE WORKSHOP

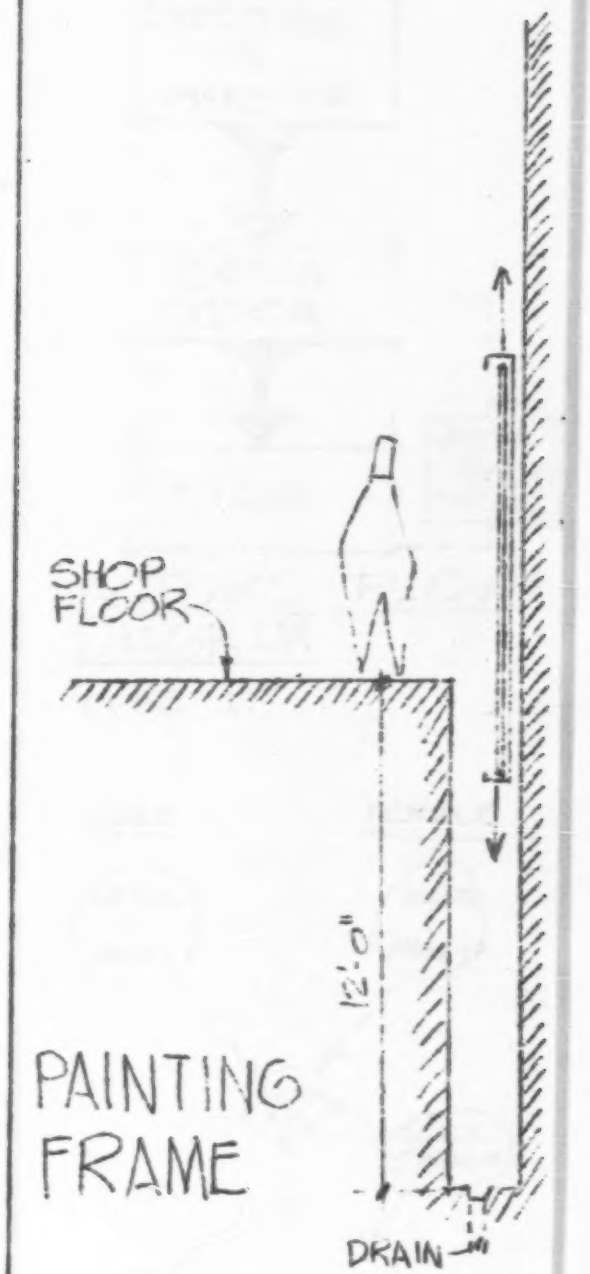
The workshop should be near the stage, accessible to it through large service doors of ceiling height and 10'-12' in width. If the workshop has a common wall with the stage, the problem of noise transmission must be considered. If possible, it is best to provide a sound buffer space between the workshop and stage such as a dead storage area. The floor of the shop should be level with the stage. Shops located a floor above or below the stage are not recommended. The mistake here is to presume that the theatre shop can be placed in some cubage not otherwise allocated in the building. The theatre workshop needs a large space, shaped to its needs, and properly related to the stage. In addition to being immediately accessible to the stage, it must open to the outside, to a loading dock, and to a service drive. The loading doors should also be large. The shop should be 18'-20' in height. At least 800 sq. feet of floor space should be provided as an unobstructed area. Although the shop does not have to be square, the design should avoid long corridors and L or T shaped rooms, as the square footage thus provided cannot be used efficiently. The technician's office might well be related to the shop, and other areas such as paint storage or lighting storage might be related to it, but not intruding into this open space. Other than some tool cabinets,



lumber racks, sinks, etc., which are located around the walls of the room, most of the equipment is movable so that the space can be adjusted to the job. One part of the room, usually that closest to the stage, is reserved, in part, for trial set-up where units, if not full settings, can be joined for checking purposes. No attempt will be made to locate the various functions within the workshop, but these materials, tools and functions will be found there:

> lumber stock, miscellaneous materials, framing bench or table, storage racks for finished and partly completed scenery, cut-off or table saw, drill press, paint stock and tool cabinet for hand tools.

In the absence of an enlarged section of offstage space, the shop will also probably serve as a paint area. It should be provided with a paint frame about 45' long and capable of recessing 12' into the floor. An entire flat set must be accommodated on the frame at one time and with a 12' recess it will be possible to paint flats or drops up to 18' in height while still working on the shop floor. Drainage and clean-out provisions must be made for the paint well.



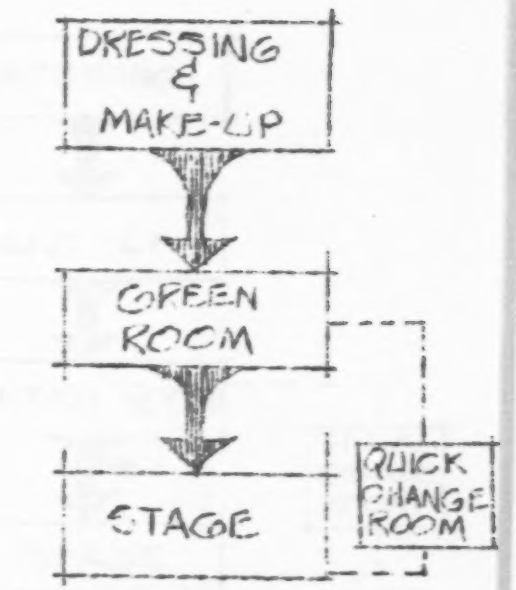
DRESSING ROOMS

Unless the high school theatre is occasionally used for outside attractions, it is not recommended that private or "star" dressing rooms be provided. One large dressing room for men and another for women will suffice, although some teachers might prefer to have this function broken up into smaller units for control purposes. Frequently a high school

production might have as many as 75 people in the cast for a musical or a spectacle show. It is probably not feasible to plan the building for such a maximum usage. Two dressing room spaces to accommodate 20 people each can be justified under normal circumstances. A minimum of 25 sq. feet per person must be provided, and this will have to include some wardrobe space for street clothes, wardrobe space for costume, make-up table (with illuminated mirror) and chair for each station, wash basins, toilets and showers. Although there is a strong temptation to make a multi-purpose room out of the dressing room area, as it is frequently not in use, it should be noted that for a week or two weeks at a time it will be untenable for other purposes. If the other functions can be theatre functions there is a possibility of some multi-use.

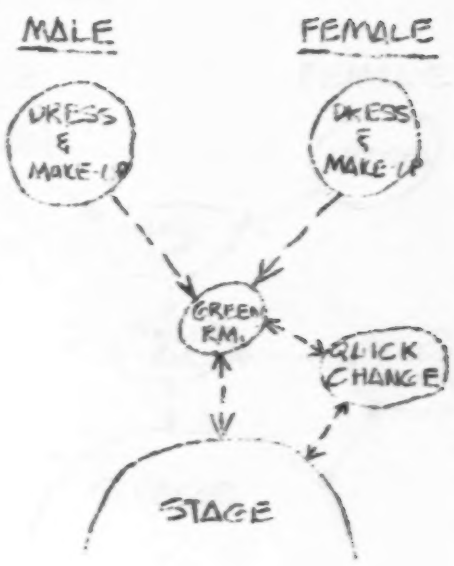
The dressing rooms need not be adjacent to the stage nor on the same floor, although this is desirable. However, if they are some distance away, it may be necessary to provide a quick change room near the stage for those cases where the actor does not have time to make a complete roundtrip to the regular dressing rooms.

For those occasions when the two regular dressing rooms are inadequate to handle a large group, some other large area such as the rehearsal space, or even a portion of the teaching station, may be pressed into service. The ideal solution is a large room designated as a chorus dressing room and which can have other useful functions such as auxiliary meeting or rehearsal space.



ACTORS FLOW DIAGRAM

TYPE 1.

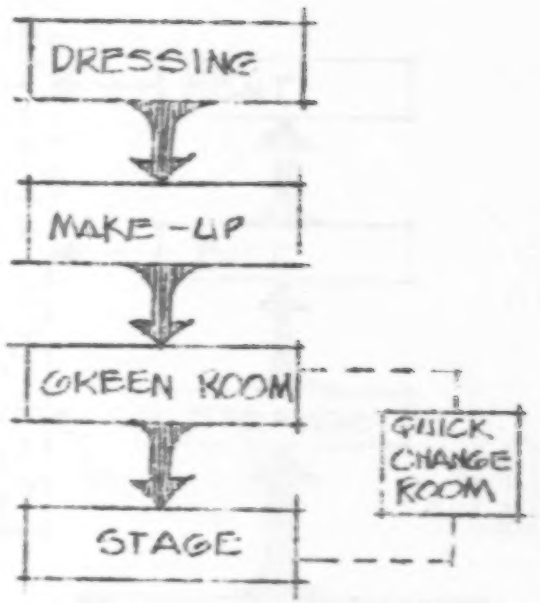


MAKE-UP ROOM

As was mentioned earlier, the procedure instituted by a teacher may require a make-up room where all make-up supplies are kept, and where the individual performers report for the application of their make-up. Presuming that not more than three or four actors can be in the make-up process simultaneously, a room of 100 square feet will serve. No special equipment is necessary, but lockable cabinets for make-up storage should be provided.

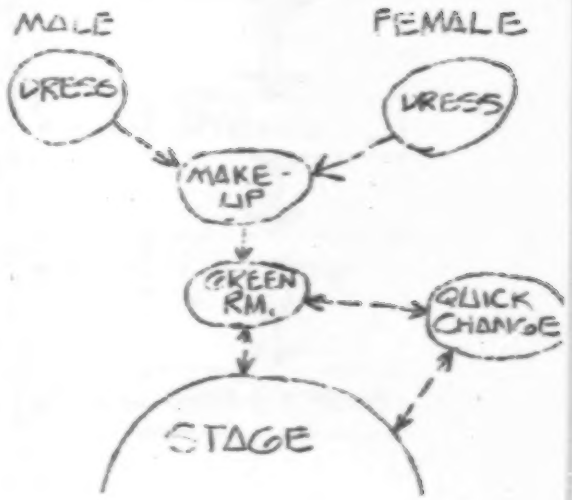
THE STAGE ANTEROOM OR GREEN ROOM

This room can serve as lounge or club room at other times, but during the progress of rehearsal and performance of a show it is, in effect, the actor's waiting room. Contrary to the popular misconception, this is not a room with rich furnishings in which actors receive their flowers or chat with friends or relatives, but a place for the actor to sit and wait for his brief moment upon the stage. It can also be used for conferences, discussions, and other small group meetings. It is a comfortable but perhaps plain room of about 350 sq. feet, furnished with reasonably comfortable and sturdy lounge furniture, and placed close to the stage in the traffic pattern between stage and dressing room. Placed in an odd corner of the building, or a flight of stairs away from both dressing rooms and stage, it cannot serve its purpose. In terms



ACTORS FLOW DIAGRAM

TYPE 2.



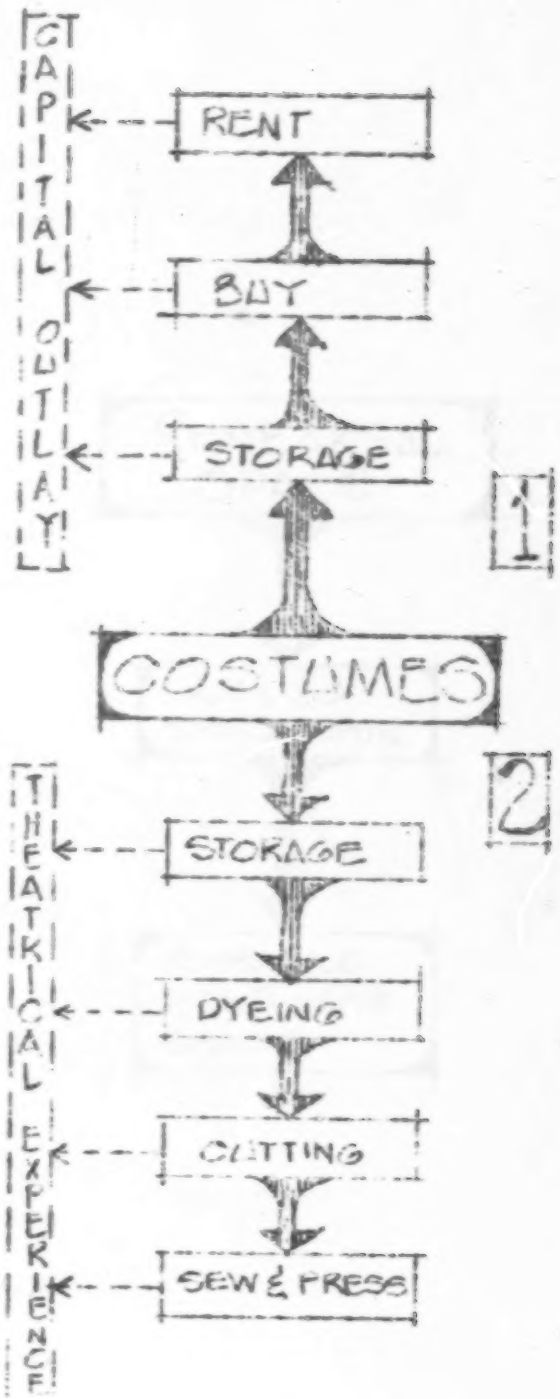
of use-occupancy it will probably be the busiest of all of the theatre rooms.

COSTUME ROOM

Some secondary schools may decide not to include costume space. This is usually a mistake because, although initially they do not plan to go into costume construction, they will acquire costumes which they wish to store. They will have to do work on costumes rented, and they will find themselves with a flourishing costume operation housed in an office or storage room. The main requirements in costume are space for dead storage (cabinets) and space for costume construction, which includes materials, pattern drafting, cutting, dyeing, sewing, pressing, and fitting. The appointments of the room should be left to the individual supervising this part of the work. The emphasis here is merely to guarantee that the space be supplied in the initial planning. 500 sq. feet will provide working room and minimum storage.

REHEARSAL SPACE

Because the stage and auditorium cannot normally be tied up by rehearsals, it is necessary to supply equivalent space elsewhere for the long periods of preparation for the public performance. A studio theatre or teaching station, if included, may serve as rehearsal space; otherwise a large room equivalent in size and shape to the largest acting area contemplated on the stage must be



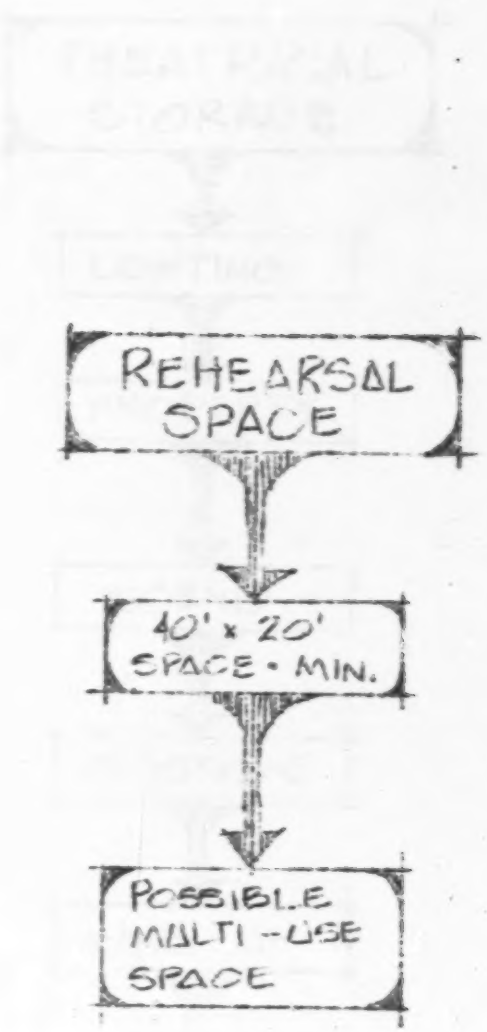
provided. Since this is basically only square footage with no particular equipment, it may be shared with other theatre functions or even with other activities in the school, if it is understood to be available for theatre rehearsal during those hours normally used for that purpose. A room 40' X 20' will serve if it is free of furniture.

LIGHTING STORAGE

Although many lighting instruments will be hanging permanently, there will be some which will be in storage or in the process of repair or refocusing. A small room of 150 sq. feet with tiered racks and a work bench will serve.

PROPERTY STORAGE

Property storage is primarily dead storage for items which have a continuing life but are not currently in use. Many of these items (such as sofas, benches, pictures) are bulky and considerable space is required for the shelves, bins, etc. necessary to house them. Provision should be made for systematic storage under lock. Although it must be possible to get the large objects in and out of the room, convenience is not an essential factor. The usual failing is to provide no such facility, and the properties are stacked in a steam tunnel or an attic and left to gather dust or to disintegrate.

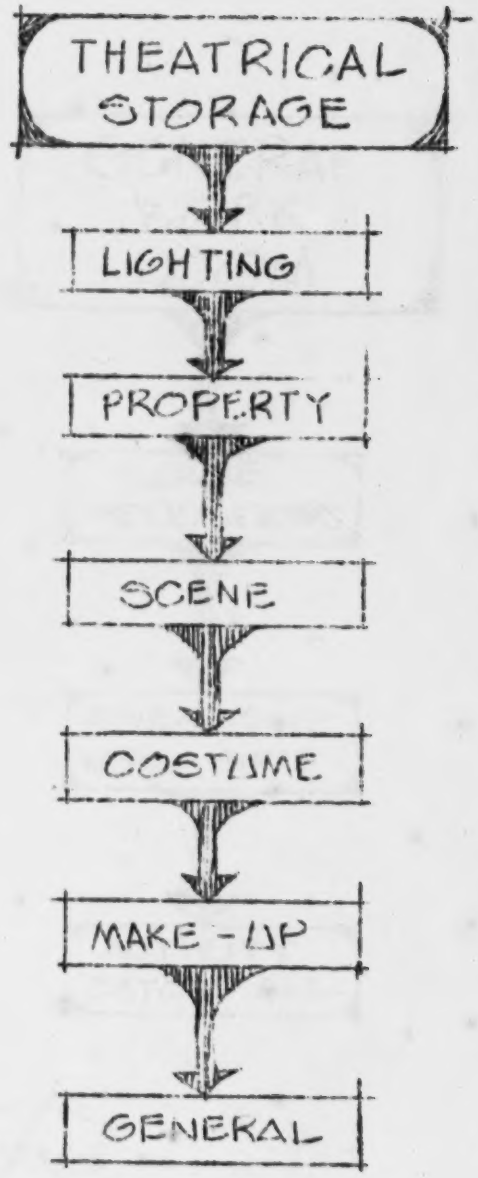


SCENE STORAGE

The common practice is to store scenery on the stage or in the workshop. This is not a satisfactory arrangement, as all of the space in those two areas is planned for other specific functions. Although the theatre is prone to save too much of its product, there are some items which are standard, and having them in storage will be an effective saving of time and money. Flats, plugs, arches, door frames, windows, columns, platforms, and stairs capable of being remodeled and used over and over again. It is a false economy to do without them, and even less commendable to use them once and then throw them away. This storage is basically dead storage, as none of the units in current use would be stored there. The space does not have to be near the stage, and in some cases has even been placed in another building. It is inevitable that it will exist somewhere, and prudent planning suggests that it should be incorporated in the original plans for the secondary school theatre structure. However, it is highly desirable to have this space conveniently located near the stage.

DRESSING ROOMS - CREW

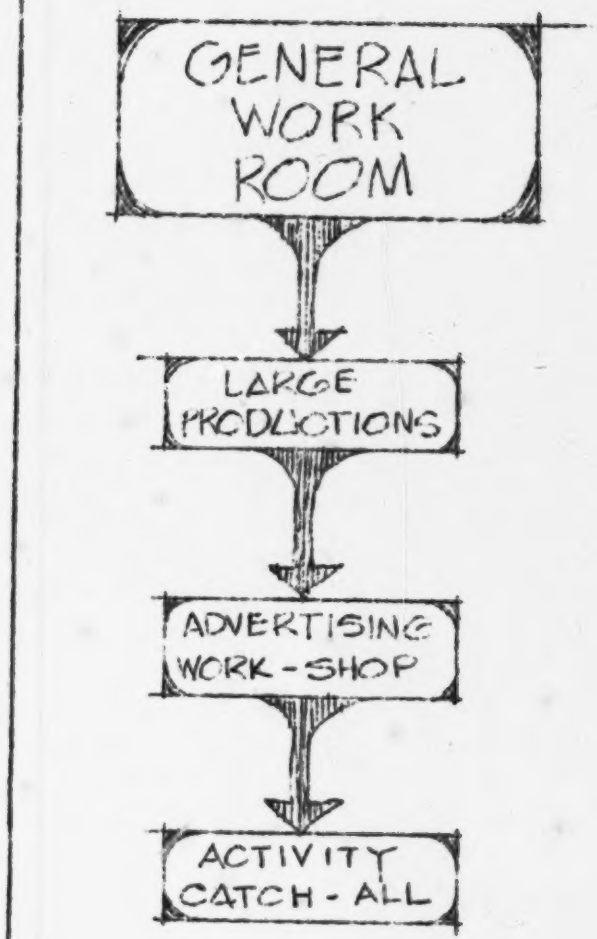
The crew will often find it necessary to change clothing also, so some kind of change rooms should be provided for them, and wash basins, toilets, showers and individual lockers should be provided for their clothing and belongings.



This function can be performed in the cast dressing rooms but it may add to the confusion and congestion there and not much space will be required for separate quarters.

GENERAL WORK ROOM

There are some work elements of the theatre that do not fit conveniently into the spaces described previously and a general work room will be very useful. For example, the advertising program for a play may require the layout of display material, the printing and drying of silk screen posters, and a sizeable mailing operation. The property requirements of the play may require the construction of great numbers of small objects which do not need shop equipment facilities, and such a room may be pressed into service. An emergency costume crew could be temporarily housed in a general work room; for a large cast it may be used as a chorus or auxiliary dressing room; for a musical production it may serve as instrument storage and tuning area for the instrumentalists. Even a small room of 400 sq. feet will be an invaluable addition when it is not permanently committed and is available for general theatrical work purposes. If it is provided, do not yield to the temptation of making it a storage area. It must remain free for a day to day, if not hour to hour, redesignation.



Chapter V
EQUIPMENT

The equipment for the secondary school theatre should be of high quality throughout. Durability is a factor as this type theatre has a use ratio that is considerably greater than that of theatres in other types of installations. The greatest security can be obtained by initial reliance on the services of the consultant as described in Chapter I. Although equipment companies are well acquainted with the needs of the secondary school, they have been known to recommend inferior quality and excessive quantity. The equipment salesman has as one of his major objectives the placement of his product in the school. In order to do so he may be tempted to bid the job with inferior equipment, or if the budget is not limited, to specify a larger quantity than is necessary. The consultant, without manufacturing or commercial ties, has no such motivations. In this chapter the types of equipment will be divided into these basic catagories: Lighting Control Equipment, Lighting Instruments and Accessories, Rigging Equipment, Sound Equipment, Draperies, Dimensional Units, and Tools. Some specific types of equipment are to be recommended for certain kinds of theatres and will be noted as such. In general, however, the comments on draperies, tools, etc. are applicable to all theatres, varying only in size or capacity.

LIGHTING CONTROL EQUIPMENT

There is a great variety in available control systems. Not only are there many

types of control, but several manufacturers will have different solutions within each of the types. The variety of types ranges from simple package units to extensive, sophisticated, custom designed systems. The planner must understand that the kind and complexity of lighting control to be recommended depends upon (a) the need, as indicated by the program for the structure, (b) available funds, which can be allocated for this item, (c) personnel for supervision and maintenance, and (d) the single or multiple use of the building as theatre, lecture hall, classroom, civic auditorium, etc. The recommendations here, as elsewhere in the text, presume a high school auditorium reasonably restricted in its use to customary high school activity.

There are two principal types of dimmers commonly being manufactured today: (a) auto-transformer (b) electronic. In the latter category, the latest development and that which seems to offer the greatest advantages, is known as the solid state or silicon controlled rectifier dimmer. At present, a 2-scene preset control system of the silicon rectifier type costs 35% to 50% more than a custom designed auto-transformer system of comparable capacity, but initial installation costs should not be allowed to be the determining factor as there are great advantages in the SCR equipment, such as: (a) far greater flexibility resulting from the preset feature as opposed to direct manual operation, (b) reduction of elimination of on-stage space requirements for location of lighting control equipment,

(c) small control panel which can be remotely located in optimum viewing position for following cues (such as the rear of the auditorium controlroom discussed in Chapter II), (d) reduced error factor in operation, (e) less costly and easier to maintain in the long-range view, (f) permits far greater artistic creativity. Contrary to some expressed opinion, the SCR control systems are not difficult to operate; they are easy to maintain since there are few moving parts and have virtually no components which should cause trouble.

The foregoing comments relate to basic considerations for the lighting control system and assume a modest or average budget for this installation. If an absolute minimal allocation has been provided, there is little doubt that the least expensive control obtainable is the portable packaged dimming equipment. Such a unit could consist of 6 auto-transformer dimmers of approximately 2500 watt capacity, which can be operated independently or ganged to operate together by a master control handle. This would be a relatively small unit (dimensions approximately 38" long, 15" high, 18" deep) and which, although weighing about 200 pounds, can be moved easily and located out of the way of other activity. Installation of three or four of these units, although not initially recommended, offers a modestly priced light control system and one which operates quite satisfactorily for limited operations. It is to be hoped that no new structure will be limited to this type of control installation.

There should be a minimum of 20-24 dimmer circuits or channels with a capacity of 6 kw each. (The 6 kw capacity is recommended because the difference in cost between the 3 kw and the 6 kw units in the electronic devices is slight, and thus large capacity dimmers are provided for heavy loading potential, but full scale control is still retained for smaller loads.) This number of dimmers should be in addition to whatever might be the requirements for house light control. The dimmers listed are to be available for stage use primarily, although, as an economy measure, throw-over switches may be installed to make these units serviceable for the house lights. The control system should incorporate the preset feature. A 2 scene preset is the least expensive; however, 3 or 5 scene presetting is obviously more desirable for any complex lighting plot. Although prices vary greatly between manufacturers and in relationship to the complexity of the equipment, the superior control system will cost between $600 and $1000 per circuit installed.

A patch, or cross connect, panel is a most desirable feature and should be an integral part of the stage lighting distribution and control system. It should be in a readily accessible but guarded position. There are a number of types of selectors, but the cord or jack type has proved reliable and modestly priced. As a generalization, it is possible to figure the cost of the wiring of the stage lighting circuits and the interconnecting panel as approximately $100

per stage load circuit. (The patch panel is the terminus for all of the stage circuits, both load and dimmer. The stage load circuits commonly terminate in a heavy duty telephone switch board type jack which can be plugged into any dimmer, the outlets for which are located on the other half of the panel.) Building in this flexibility makes a vast improvement in the light control system over the permanently wired circuits so commonly found in a great number of auditoriums.

State Load Circuits The greater the number of stage load circuits the greater the flexibility of the system. There should be at least three times as many outlet circuits as there are control circuits. For the recommended minimum of 20-24 circuit control system, this would mean a minimum of 60-72 load circuits. Each of these stage load circuits can be made even more flexible if they are split and have outlets on opposing sides of the stage. In this way a single control circuit can be patched to a single load circuit, which, in turn, services two or more instruments on opposing sides of the stage without running floor cable or utilizing two load circuits. It will also be desirable to have each branch circuit terminate in duplex or triplex outlets. Such items add very little cost at the time of installation, and greatly increase the flexibility of the wiring system. Regular stage connector (grounded) outlets are recommended, although twist-lock installations are approved in some localities. Because of

the highly individual nature of each structure, and the very personal approach of the individual teacher (technician) to the problem of stage lighting, it is not practical to detail the number of outlets for each stage location. However, the following may be used as a guide: 20% in the beam position (auditorium ceiling), 10% in footlight position and auditorium fins, 40% in overhead positions such as light bridge, 1st and 2nd pipes, etc., 10% for cyclorama lighting, 10% for auxiliary service (floor outlets) and 10% for miscellaneous follow spots, specials, etc.

LIGHTING INSTRUMENTS AND ACCESSORIES

It is impossible to specify the exact number or type of instruents. Requirements vary according to the complexity of the lighting problem and the preference of the individual. The complement enumerated below is an outline of good equipment within the means of the average budget, and which will provide for meaningful educational and artistic experience for secondary school students.

Ellipsoidal reflector spotlights 18-24 units

8" 750-1000 watt units to be mounted in the beam and side lighting position in front of the proscenium. 8-12 units

6" 500 watt units to be used on stage for specials, side lights confined areas, etc. 10-12 units

6" 500 watt fresnel lights to be used on stage for area lights from the bridge, 1st pipe, side lighting, backings, etc. 18-24 units

Scoops, 14" 300-500 watt for general flood lighting, cyc lighting, blending, etc. 4-6 units

Strips. 3-4 color portable borderlight strips either in 6' or 8' lengths and equipped to accommodate 150w R40 spot lamps or flood lamps. Each strip shall be furnished with plugs on leads at one end and receptacles on leads on the opposite end. A limited number of strips are useful for cyc lighting, for blending and toning the acting area, occasionally as footlights, and for backing lights. Additional strips are the easiest method of lighting the stage for all those events which inhabit the theatre but do not require other than general light. These units should not be tied in permanently but available for hanging and/or patching as required. 3 sections

Projection units of the direct beam or Linnebach type. 1-2 units

Incandescent follow spot lights, or if the house is relatively large, an arc spot may be required. 1-2 units

Accessories:

Hanging light ladders. 2 units

Light stands, 8' telescopic. 4 units

Barn doors to fit the 6" spotlights. 6 units

Top hats to fit the 6" spotlights. 6 units

Color wheel for follow spot use. 1 unit

#14 S type stage cable. Connectors and plugs to make up necessary jumpers and stage cables. 2000 feet

Extra color frames for all instruments. Stock of color mediums - gelatine or plastic type.

No motion picture or slide projection equipment is listed here, as it is presumed that this will be available in the school pool or visual aids. However, permanent wiring should be provided which can be connected with auditorium speakers.

RIGGING EQUIPMENT

In general, the synchronous motor grid winch system is not recommended for secondary school installation. It is true that this type of sophisticated equipment may be used to advantage for heavy, permanent installations that vary in weight, and which require frequent handling, such as the lightbridge, light battens, sound shells, false proscenium, etc. However, the PANEL believes that the high school stage had best be equipped with manual equipment consisting of perhaps a few hand sets, but predominently counterweight sets of the T-bar type mount. For the stage outlined in Chapter II there should be a minimum of 24-30 sets of lines including those assigned to permanent equipment such as the valance, house curtain, borders, light pipes, cyclorama, etc. The number of lines per set is dependent upon the width of the setting area (length of batten) with a line at each end and other lines spread at intervals of 10 to 12 feet. A thirty-six foot span would require four lines to the set. Battens employed are normally 1½" pipe, and the total load capacity is about 700 pounds. The counter-weight set, as described, would consist of the floor block, with adjustable tension

normally located on the stage floor at the unobstructed side wall selected for the system, and the T-bar guide on which is mounted the arbor. The individual lines (steel cable) are attached to the arbor and pass over a headblock consisting of separate sheaves for each line and a sheave for the purchase line which operates the arbor. From the head block the lines cross the gridiron to successive loft blocks usually mounted at wells (cable slots) spaced within the gridiron. All blocks should have ball or roller bearings. At the individual block the line turns toward the stage floor and is tied or clamped to the batten. (Wire rope lines should be tied to battens with clove hitch and fastened with 2 wire rope clips.) Hand sets of rope lines should be long enough to reach either the floor or the fly gallery (pinrail) from which they are operated, while the batten is on the floor. The counterweight system employs a locking rail through which the control ropes pass, and which allows them to be locked at any position. Additional counterweights may be added to the arbor or removed from the arbor on a loading platform about eight feet below the gridiron. If a loading platform is not provided, the full load on any one set of lines must be pulled all the way to the gridiron if the weights are to be added at floor level. This process is reversed for unloading. Most gridirons are constructed of channel iron or I-beams, however, some of the new webbed metal structures are coming into use as a working

floor on the grid. Blocks or sheaves should not be mounted on this latter type of working floor, as it is not usually designed to take such a concentrated load. Access to the gridiron should be provided by circular stairs rather than a vertical ladder.

Although the floor of the gridiron is a working surface, it is not essential that a great comfort level be maintained here. Workers must be able to move around freely, but the spacious 8' headroom often provided is an expensive luxury.

SOUND COMMUNICATION EQUIPMENT

The question as to whether the sound equipment should be completely portable or should consist of some fixed components is debatable. The answer can only be found in the philosophy of its use. Some recommend the fixed components, if for no other reason than that they are more secure against theft. The basic components will include, as a minimum:

Amplifier and/or mixing console. Four input channels and some type of sound patch to permit selective routing. One such amplifier will serve most operational needs. However, it will be desirable to have a second unit available for standby in case of failure. 1 unit

Pre-Amplifier. 1 unit

Dual-variable speed stereo turntables. 1 pair

Tape decks. 2 units

High fidelity speakers. 4 units

Microphones. 2 units

Suitable microphone cable and speaker cable.

This equipment is usually stored, and the control equipment used in the sound control room described in Chapter II. Recording and editing operations can usually be done there also, so no special storage or work room is required.

Inter-Communication System

All major operational points of the stage: stage manager stations right and left, director's position, sound booth, pinrail, light control, all light stations including follow spot, box office, house manager's office, dressing rooms, green room, etc. should be connected with a good intercommunications system. A separate call system on each station is important, and the call should be capable of shifting at will from audible or visible signal. Experience would indicate that all operational stations are best served by headphone sets which provide 2-way communication except in the regular offices, dressing rooms, or green room. Dressing room speakers are sometimes one way, but provision for talk-back is necessary or desirable at times.

Show Monitor

In addition to show sound and intercommunication, most of the work areas of the theatre should be provided with speakers, and a live circuit which brings them

the audio of the show for cueing purposes. This can be picked up by a fixed microphone in the beam position (auditorium ceiling) and serviced through an amplifier with fixed amplification and routed to the separate areas, each of which has a separate volume level controlled speaker.

DRAPERIES

(In general, no specific dimensional data can be supplied here, as the draperies must be fitted to the unique dimensions of each individual installation. However, it is important to realize that skimping on the quality or quantity of textiles used is a false economy.)

Asbestos or Fire Curtain

Local building codes will specify if asbestos or fire curtain is required. The present trend in code revision is to eliminate this equipment.

Front Curtain and Teaser or Valance

Richness, weight and opaqueness are the essential requirements for the matching front curtain and teaser. It should be of a heavy pile material such as velour, with at least 50% fullness, 36" overlap in the center for traveler operation, and fully lined. Simplicity in design is to be recommended, and the darker colors are restful and a pleasing background when employed as a backing for speakers, etc.

Cyclorama

This term is more often used to mean a stretched, seamless sky cyclorama of gray or grayed blue muslin. Light weight materials are better, as the wrinkles stretch out and present a smoother lighting surface. Such a cyclorama can be mounted on a curved traveling track and pulled around to one position for storage, or it can be permanently mounted on a curved top and curved bottom batten and operate with vertical movement on a single or double set of lines from the counterweight system. This cyclorama ideally should be high enough so that it will clear sight lines with a fairly high trim, and with only one teaser. In this case it may be so high that it will not fly enough to clear for scenery movement. In this case a separate set of lines can be attached to the bottom curved batten and the bottom of the cyc tripped up rather than, or in addition to, lifting from the top. If a stretched, seamless cyclorama is not provided, one of the following drapery sets must perform this function.

Drapery Set

At least one set of stage drapery consisting of 1 to 3 travelers, and suitable borders and pairs of masking side legs; the correct number to be determined by a study of the sight lines in relationship to other masking equipment. This set of curtains is made up of matching fullness at least 50%.

If only one set of stage draperies can be purchased, it probably should be of a neutral color to blend with the multiple activities which take place on the stage of the theatre. If a second set can be purchased it could be of black, as this is a strongly utilitarian color.

Scrim

Although not required, one sharkstooth scrim is strongly recommended. This should be of sufficient size to back the entire acting area. (A 40' X 24' scrim will adequately serve for a 30' X 18' stage opening).

Movie Screen (Without speakers attached)

A high reflective quality screen, stretched on a permanent frame of dimensions commensurate with its use and the capacity of the projection system.

DIMENSIONAL UNITS AND RISERS

Chorus or orchestra risers, if the theatre is to be used for the performance of musical events. These may also be used for other events and even as a part of theatrical effect staging. 1 set

Platforms for stage settings. Usually of some sort of collapsible construction to simplify the storage problems. These are made up in standard modular units (3' X 6' or 4' X 8' are the most common basic unit sizes of the platform tops and the heights of the supporting units are in 12" variables) which can be utilized for creating separate platforms, building up sections of the stage, or scenic units such as balconies. 6-12 units.

Additional miscellaneous units such as steps (modular with the platforms) columns, benches, rocks, stumps, etc. will inevitably be used, but it may not be desirable to include such items in the building contract or even the equipment contract.

Sound Shell

A number of prefabricated sound shells are available from reliable manufacturers. They are often quite expensive, and it is doubtful if they can be economically justified in a high school. Much of their function can be performed by the hanging of sound reflecting panels or planks, either separately or as hinged units, above the playing area for orchestra or choral events. The handling and storage of such a unit or units is done with the standard rigging system.

TOOLS AND HANDLING EQUIPMENT

Some of the equipment outlined below may be available in the school wood-working shop or in the custodian's workshop. However, the well organized stage and shop should have its own tools for which its staff is personally responsible. Constant borrowing back and forth from the manual arts area, or from the janitor, destroys the control and discipline that should be a part of any educational system. The economy in time and the convenience of theatre owned equipment should also be considered.

Construction, Paint and Electrical Shop

Power tools	Table or pull-over saw, drill press, sabre saw, ¼" hand electric drill.
Hand tools	Saws, hammers, pliers, wire cutters, rulers, adjustable wrenches, screwdrivers, squares, pipe wrenches, wrecking bars, staple gun, utility knives, soldering iron, brace, wood and metal bits, levels, brushes (a supply of various sizes ranging from small liners to large lay-in brushes) snap lines, straight edges.

Stage Equipment and Tools

Aluminum scaffold or platform mounted ladder.

Assorted height step ladders. 2-4 units

Assorted length stage braces, stage screws.

Cleaning tools: brooms, brushes, mops, pails, etc.

EQUIPMENT FOR THE TEACHING STATION

Since the equipment problems may vary in number, if not in kind, between the large stage and the teaching station, it is desirable to list the equipment needs of the latter separately. The physical properties of the room are described in Chapter VI. A major part of the seating is portable, and linkable padded folding metal chairs with arms are recommended. Staging equipment includes:

Portable dimming equipment incorporating 6-12 circuits with capacity of 1000-2000 per circuit as previously described in this chapter. 1 unit

500 watt ellipsoidal reflector spotlights. 8 units

6" 500 watt fresnel lights. 8 units

14" scoops, 300-500 watts. 3 units

Strip sections for ground row, cyc, or toning lights. 3 units

Light stands, 8' telescopic. 2 units

Adequate cable (approximately 500'-1000')

Front curtains and interior drapes (see Draperies).

Cyclorama (see Draperies).

Although the equipment listed in this chapter is selected primarily to service the two specific theatre forms which have been outlined in the report, it is probable that the same equipment list would serve, in large part, for any other theatre form which might be recommended for the secondary school.

Chapter VI
THE THEATRE ARTS LABRATORY TEACHING STATION

As was outlined in Chapter 1, there are many types of space facility which can be employed in the Theatre Arts program. The Theatre Arts Labratory Teaching Station is primarily a classroom which is designed for, and specifically allocated to, the teaching of theatre arts subjects. It is presumed that this room will probably be assigned to a single teacher, or to a small group of teachers, employed in a team teaching concept. With only slight expansion, however, it might serve in some instances as a very comfortable and pleasant place for public performance. It is not designed primarily as a replacement for a conventional secondary school auditorium. Its existence, however, will emphasize the fact that the well appointed auditorium is not essential for the successful pursuance of a theatre arts program. Under ideal circumstances such a facility would be employed on a day to day basis by the teacher in the normal progress of instruction, and therefore could be considered a supplement to the auditorium employed for the larger public performances. In addition to the normal daily class functions, it would be entirely appropriate to employ the teaching station, on occassion, for public presentation of material adapted to this space, and where the seating would accommodate a small invited, or even paying audience.

Although some dimensional data is provided, it should be remembered that this

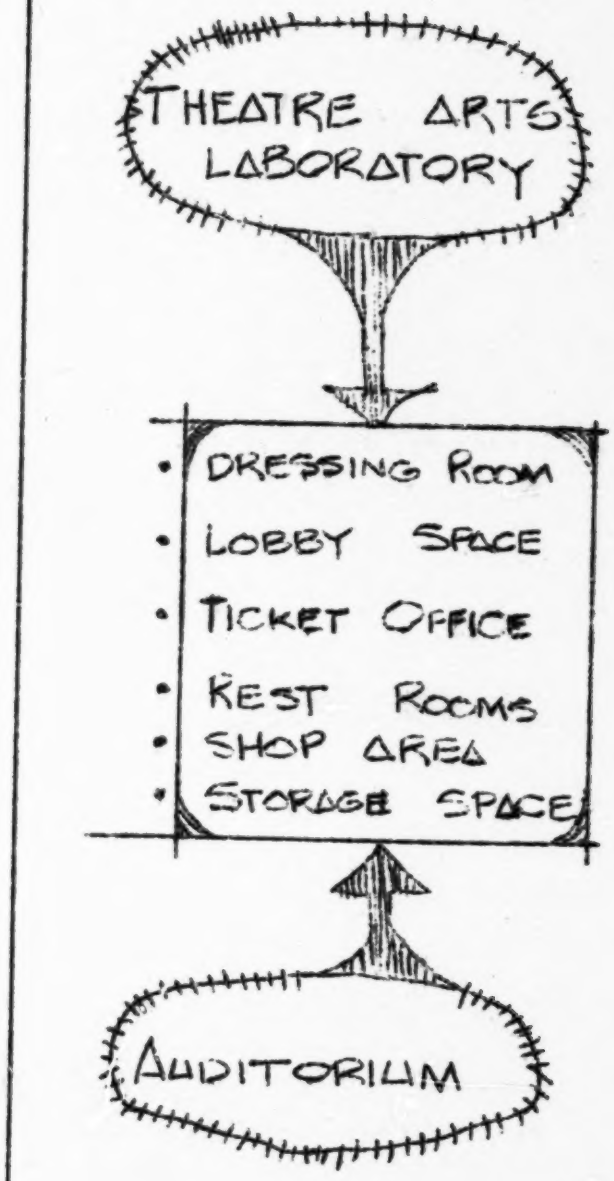
TEACHING MEDIUM

PERFORMANCE
&
SOCIAL MEDIUM

represents only a suggested treatment and that, in specific instances, a room might change its shape perceptibly and be increased or decreased in size. The basic concept of this room implies its primary function is that of a classroom, and a continual enlargement of this facility approaching a small auditorium would be undesirable. The term "teaching station" is employed rather than "little" or "studio theatre" in an attempt to emphasize its classroom function.

SEPARATE SERVICE FACILITIES

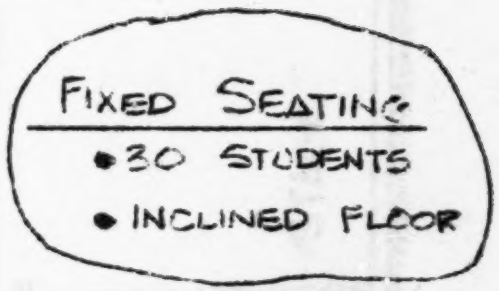
If the school has separate auditorium facilities, it is recommended that the teaching station be nearby in order that some of the service areas might be employed by both of these theatre units. As an example - it would be possible for the teaching station and the auditorium to use the same dressing rooms, the same lobby space, the same ticket offices, the same rest rooms, the same shop area, and some of the same storage area. Although it is true that on occasion both of these producing units might be in performance simultaneously, it is not probable that this would occur frequently enough to warrant complete duplication of all these service areas. However, such space is absolutely essential, and, if it is not provided in connection with some other function of the building, it will be necessary to plan it in connection with the teaching station. Comments on these facilities, and the necessary equipment, have been described in Chapter III, The

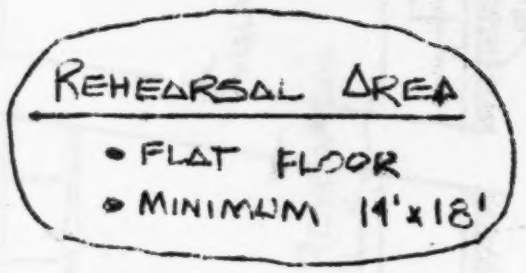


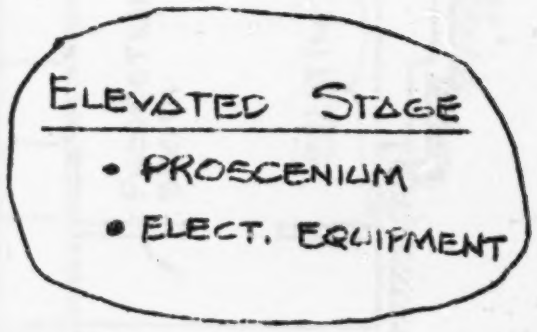
COMMON SPACES & ACTIVITES

Public Service Areas. In the description which follows, it will be apparent that there are a number of advantages to having the teaching station accessible from four sides. The dimensional data suggests the possiblity, but does not imply or demand, that the teaching station occupy space equivalent in size and shape to two standard classrooms. The recommended plan includes space for normal classroom function, space for arena-type presentation, space for proscenium and thrust stage presentations, and allows all of this space to be converted to other multiple theatre purposes.

The area designated as the teaching station would be divided roughly into three parts: (1) some fixed seating on an inclined floor accommodating about 30 students. Chairs to be equipped with moveable, tablet arms. Within some individual teaching philosophies it might be preferred as a flat floor with moveable chairs. (2) An elevated stage, presumably at the opposite end from the fixed seating just described, and with the usual physical and electrical equipment. Employed as a proscenium stage, there would be space for seating approximately 80 in the fixed seating described plus temporary seating in the space next described. (3) A flat floor area between (1) and (2) for rehearsal, demonstration and arena staging, a playing area of at least 14' X 18', and with the usual lighting and mechanical equipment. When this area is employed for arena staging, and all other





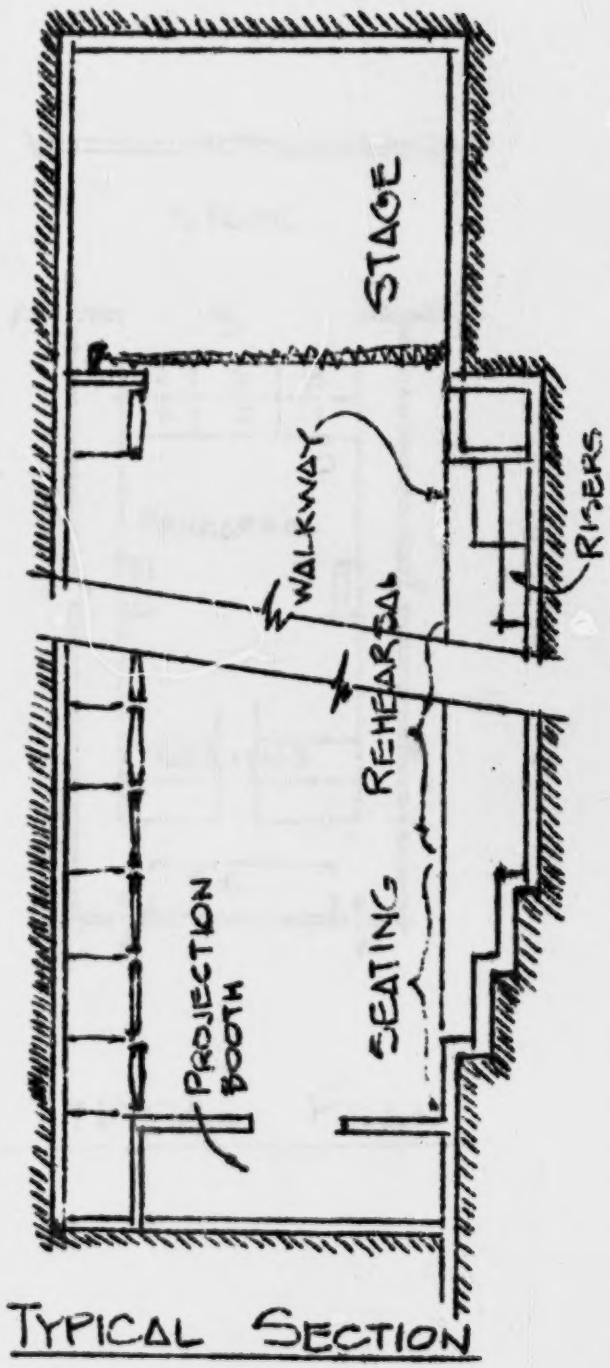


SEPARATE ELEMENTS

areas adapted to seating, it would accommodate approximately 140. The minimum width of this room would be 24' and widths up to 36' would prove additionally desirable. The total length of the room, if the areas described are laid end-to-end, would be about 70'.

If the fixed seating plan is employed for some 50 seats, and if they are on a raked (incline) or terraced floor, it is recommended that there be at least a 5" differential in the height of the rows. Back-to-back spacing of 36" is recommended for rows and 20" to 22" for individual seat widths. Other seating to be provided should be of padded metal folding chairs with arm rests. Linkable chairs have some advantages in terms of ease of movement, for regrouping, and for cleaning.

The center area of the room is recommended for general demonstration, classroom space and as an arena playing area for productions to be viewed from four sides. It is suggested that the recessed space might be 21" to 24" below that of the surrounding areas, including the service halls. This would provide a depressed area for the arena stage with some seating at that level, with other raised seating on all sides, and it would also allow for the elevated proscenium and thrust stage to be above the central floor area. Although the raised stage at the end of the room may be employed as a proscenium stage, it should not be thought of as that exclusively. Its design lends itself to other, flexible treatment.

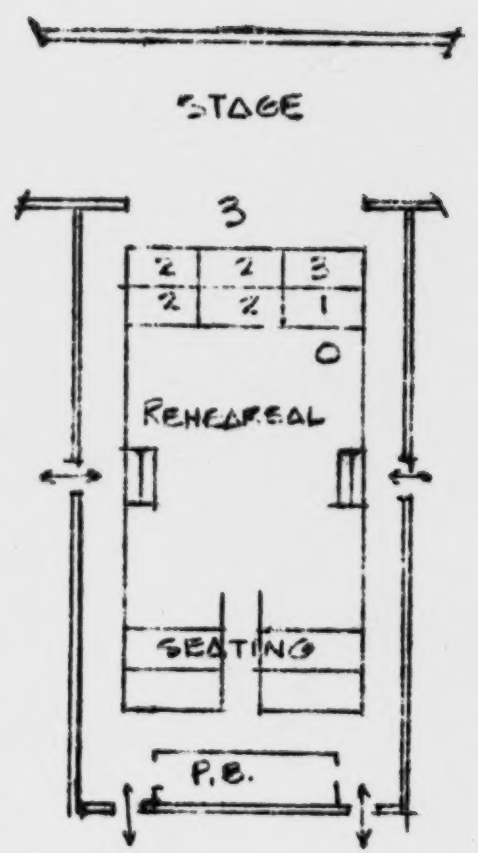


TYPICAL SECTION

There would be no fixed proscenium - the bounding edges of the opening would be established by movable sections of wall or by a simple curtain framing. This stage space should be the full width of the room at that end, and should be at least 14' deep. Although more than usual classroom height would be desirable over the stage area, it will not be necessary to provide the usual stage house or fly space. It is suggested that two levels (3' deep, each) running the full width of the stage be provided in front of the fixed platform area with 1/3 stage height differential for each, namely 7" or 8". These levels can be created by separate, collapsible, or nesting boxes and re-employed as terraced seating spaces for the arena concept, or as variable forestage space suggested by the accompanying diagrams.

A projection room may be provided at the end of the room opposite that of the fixed stage, which would serve as a sound room and listening room, as well as accommodating projection equipment.

The ceiling of this room would be approximately 14' above the stage level, and should provide, in addition to standard room lighting, other arrangements for the hanging of special stage lighting instruments and other hanging units. These supporting members can be exposed or concealed above a false ceiling. Lighting control could be located either in the offstage area on the fixed stage floor or in the projection room described above. (See Equipment.)



TYPICAL PLAN

A walk-way of at least 42" in width should be provided on the two long sides of the room which connect the stage level at one end with the entrance level at the opposite end. For classroom use these levels would be employed as display and work areas at low table height. When the room is employed for arena staging they would serve as elevated rows of seating on the two sides. For end staging they would serve as additional side stages or for walk-ways approaching the stage for entrance, tableau, or processional purposes. If slightly enlarged, the space beneath these walk-ways could be employed for storage for seating or other theatrical equipment.

No attempt will be made here to specify a minimum of equipment for this teaching station, but it is obvious that it must have the usual complement of front traveler, cyclorama, switch board and lighting equipment. Comments on lighting equipment will be found in Chapter V.

Although it is not planned that all three of these areas would be used simultaneously in a classroom teaching station, it would be possible to have on the fixed stage scenic, lighting and property elements to be used for a public presentation, or for the use of another class while the teacher lectured or conducted a demonstration in the central area without having to clear this material. In the same way a set-up could remain in the arena section and the teacher would still

have a lecture area and a drill or rehearsal area unencumbered.

The essential features of this classroom teaching station are designed specifically to serve the purposes of theatre instruction, but if in scheduling it appears that the room is not in continual use, it could be employed quite effectively in the true multiple-purpose sense. Although specifically designed for theatre purposes, it has not lost its usefulness as a general classroom regardless of subject matter. It has a raised stage for any type of classroom performance, a large flat floor space for activities such as dancing, and could even be used as a small lecture hall.

THE STUDIO THEATRE OR LITTLE THEATRE

Although a miniature reproduction of the large auditorium and stage can be very useful as a classroom, or a classroom theatre can be enlarged to almost auditorium proportions to accommodate larger attractions and larger audiences, it is the opinion of the PANEL that these two identifiable spaces which vary greatly in size should also be conceived of and designed as separate space and to perform separate functions. The school which has a large auditorium gains less by reproducing it as a small theatre than it would by creating a specifically oriented classroom of great flexibility. The school with a good, flexible, medium sized classroom probably should have its second space as a stage and auditorium instead of a greatly enlarged classroom. The two types of theatre accommodation are complements to each other.

Chapter VII
DIVISIBLE AUDITORIUMS, ARENA THEATRE, THRUST STAGE AND OTHER THEATRE FORMS FOR THE SECONDARY SCHOOL

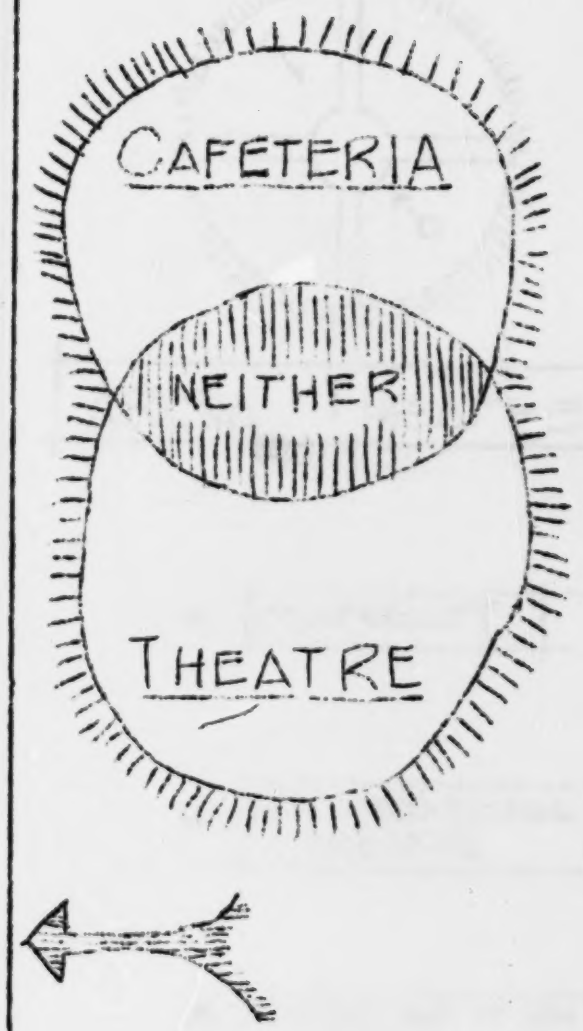
In the previous emphasis on the proscenium stage, auditorium and the theatre arts teaching station, the PANEL does not wish to imply that other forms of theatre should not be used in the high school situation. It does take the position that it could not recommend such an installation in preference to the matching facilities of those items which have been outlined in detail.

COMBINATION, GENERAL PURPOSE OR MULTI-PURPOSE ROOMS

The PANEL is convinced that no space which is an effective theatre plant can be designed for combination use. Conversely, a well designed theatre can frequently serve other purposes with only minor modifications. The "cafetorium", the "auditorium gym", the "theatre-study hall" have been the object of much experimentation. In some cases the experiments have been labeled as a success because it was found that the two functions could live together. It is not the contention of the PANEL that such combinations are impossible--only that the joint design must of necessity be a disservice to both elements in that it cannot really satisfy either.

"Multi-use space is multi-useless space."

The PANEL concludes that none of the above proposals is a proper solution to the housing problems for theatre activity in the secondary school.

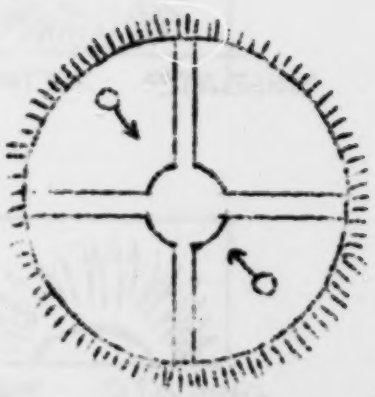


THE ARENA THEATRE

Although arena theatre is certainly a valid form,it is of doubtful value as the sole and primary form to be used for instructional purposes at this level. In providing a teaching station which can accommodate this type of production,it is conceded that it is a proper form of experimentation. However, it is too unique, too singular, too sophisticated, and too restrictive to be employed as the exclusive teaching tool at this stage of development. For those who wish detailed information on the specifications for such an installation, sources are provided in the bibliography.

THE THRUST STAGE

Within this study the thrust stage is considered to be basically a conventional auditorium with considerable proscenium modification. It is true that some of the limitations described under the auditorium heading do not prevail with the thrust stage. There can be a considerable "wrap around" factor in the auditorium, and the production areas may be limited. It is recommended that the thrust element of the stage be variable in size and location,and perhaps even in height, that it may need direct audience access and that it may present major sight line and lighting problems. These disadvantages should not be considered prohibitive, but merely items which will modify the comments made elsewhere about the typical



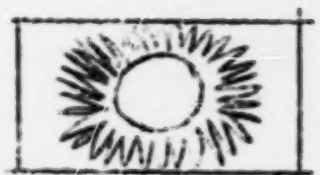
ARENA THEATRE

- CENTRALITY
- NON-TRADITIONAL THEATRE
- SINGULAR FORM

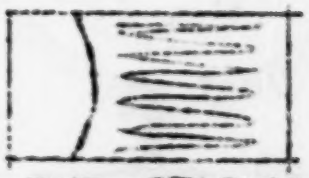
auditorium-stage accommodations. Thrust stage as an addendum to conventional staging is a valid secondary school theatre form.

THE FLEXIBLE STAGE-AUDITORIUM

The phrase, "flexible stage-auditorium" is used to describe an open area of such size as to accommodate both the audience and the performance, but in which no particular space is allocated to either of these functions. It may be used as center stage, end staging, side staging, three-quarter staging, double ended staging, double ended audience, or even a kind of "gerrymander" form in which audience areas and acting areas are interspersed. In effect, it is an attempt to make feasible the use of any kind of production-audience relationship with a minimum of readjustment. The audience chairs move, the platforming moves, the lights move, the entrances and exits move because they have been designed for flexibility . The other theatre functions remain relatively the same: the public service areas, the equipment, the back stage service areas. This form requires a high degree of imagination on the part of both teacher and student to secure maximum benefits. Its unconventional and flexible nature must be exploited if it is to be effective. If the teacher is tempted to use the same form repeatedly, it is no longer a flexible theatre and becomes merely a poor proscenium theatre, a poor arena theatre, etc.


CENTER STAGING

SIDE STAGING


END STAGING

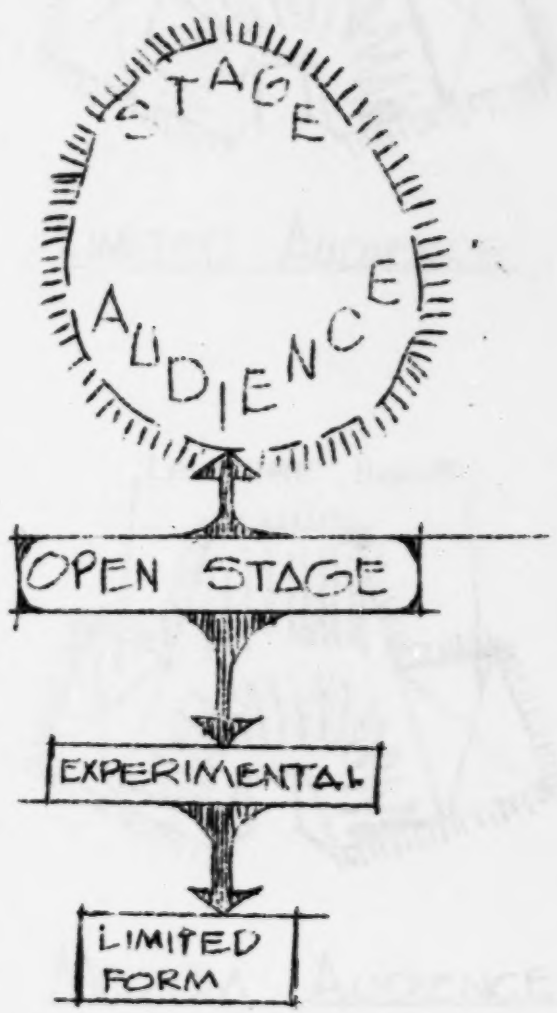
DOUBLE END STAGING

DOUBLE END AUDIENCE

"It is prohibitive economically, apart from theatrical considerations, to provide a separate space for each theatrical form, or to include all theatrical forms within the auditorium-theater by a mechanized multi-form theater (defined as the physical flexibility or convertibility of both performing areas and seating) in the secondary school program. It is also functionally prohibitive in the secondary program to include all theatrical forms within the auditorium-theater by a non-mechanized multi-form theater. While permitting a multiplicity of theatrical forms more economically, scheduling and maintenance would not permit the expense of time and labor. However, this type of multi-form theater, in a related facility supplemental to a programed auditorium-theater, i.e., dramatic arts lab, uncommitted space, is valid within the program."

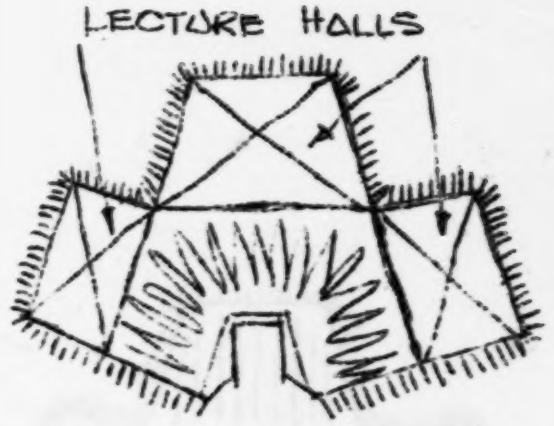
THE OPEN STAGE

The basic assumption in the open stage concept is that the relative position of audience and production remain fixed,but that there shall be no attempt at architectural separation of the two,and little or no attempt at concealment of the working elements of the "backstage" theatre;as the term implies, everything is in the open. Granted that it is a valid experimental form of theatre, it is the opinion of the PANEL that in operation the theatre practitioner will be more disturbed by what it will not do than inspired by what it will do. Many such structures have been planned by its proponents without adequate explanation of its limitations to a teacher who has not been exposed to or trained in its utilization.

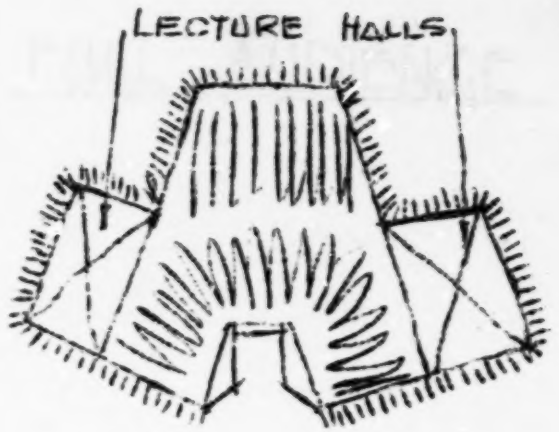


THE DIVISIBLE AUDITORIUM

With increasing costs and enlarged student bodies, school planners began to look with suspicion at the large cubage represented by the school auditorium and began to doubt its validity in terms of its use-occupancy. Here was one of the largest and costliest spaces in the school plant which could go unused for hours, or days. Even when the stage was in constant use the auditorium was still vacant but requiring heat, light, maintenance in addition to the initial cost of construction. The first impulsive move was to eliminate the construction of auditoriums in secondary schools or to plan them as separate buildings and submit them as alternates in the bidding process to be added at a later date or eliminated entirely. The complete impracticability of this solution was apparent after a few school districts had tried it and again the auditorium became an essential element in secondary school planning. With the auditorium restored it was necessary to justify it economically by multiplying its function and bring it into the regular academic schedule--to make of it a classroom or classrooms. The most acceptable solution to this dilemma is the divisible auditorium. It is important to note here that the action is not motivated by a desire to improve any single function of the auditorium as such, but to make the auditorium more acceptable as a multiple classroom, lecture area, audio-visual space, etc. Some of the solutions have been most imaginative and practical. There is a considerable added expense factor, but

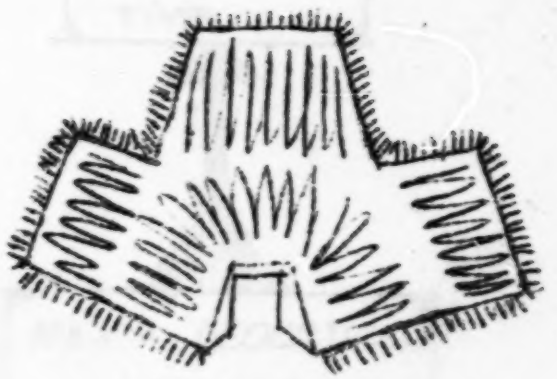


LIMITED AUDIENCE



MEDIUM AUDIENCE

the cost does not approach that of separate space provided for the separate functions. Two major problems confront the planner of the divisible auditorium. (1) The orientation of all the seats in the separate sections to provide proper sight lines and acoustical properties, and the equally important problem of creating an aesthetic unity when the space is a single auditorium, (2) an effective method of sealing each of these separate sections to provide acoustical and visual isolation and retain ready access and a workable traffic pattern. The basic problem analysis and some varied solutions are presented in a publication by Educational Facilities Laboratories under the title of Divisible Auditoriums. Space will not permit duplication of that treatment,but some of the solutions are presented diagramatically. Those interested should refer to the original text for full exposition of the ideas.



FULL AUDIENCE

Chapter VIII
RELATED CONSIDERATIONS

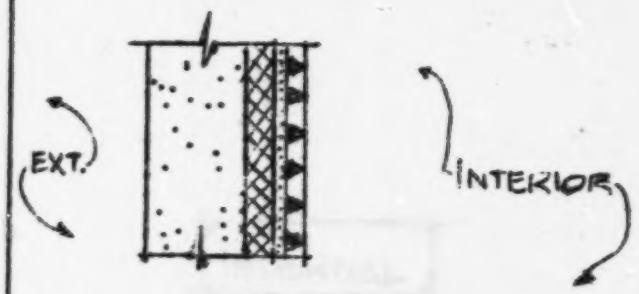
ACOUSTICS

The acoustical considerations for secondary school building are not unlike those of other theatre buildings. New forms and materials offer such a wide variety of problems that it is very important that the TEAM should be sure to employ the services of an acoustical consultant to check the pertinent factors in the auditorium. It is not probable that there will be a major acoustical problem in any of the other areas. The three principal considerations which need study are: (1) the volume of the auditorium; (2) the shape, position, and surfacing of the various reflective surfaces which affect the reverberation time within the auditorium, and (3) the noise levels which will interfere with the sound function in the theatre.

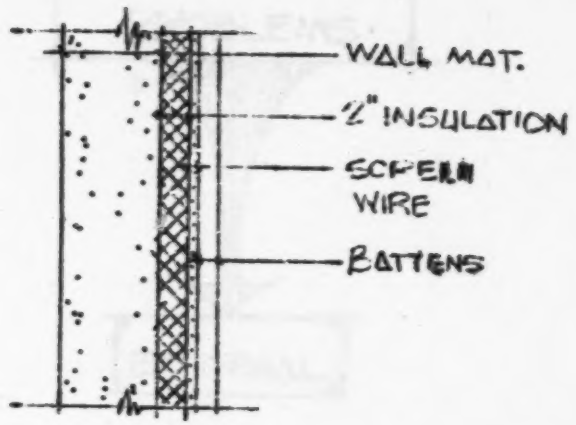
It is not difficult to predict the sound characteristics of a simple solid geometric form, but an auditorium is subject to many variables before and during performances and each of these compounds the problem. The large unbroken wall and ceiling planes, the presence or absence of spectators in all of the upholstered seats, large expanses of curtains, the balcony, the pitch of the floor, the enclosure of the acting area, and the surface treatment of all of these areas effect the acoustical properties of the room. While it is true that the ideal

reverberation time is different for music (particularly instruments)than it is for the speaking voice, a compromise can be designed into the room that is acceptable for both. For secondary school usage it is not recommended that the complicated and expensive process of reverberation adjustment be built into the structure. Some of the more common acoustical problems can be anticipated, however, it should not be presumed that the following list includes all of the problems, nor that attention to these details will provide a completely satisfactory acoustical solution.

- Avoid large expanses of opposing but parallel wall planes.
- Avoid a curved back wall, particularly if the radial center of that wall falls in the playing area of the stage.
- The ceiling over the rear of the auditorium should be inclined downward rather than up.
- Sound deadening can best be achieved by providing about two inches of sound absorbent materials such as fibre glass. Cover this with screen wire or similar material and cover this with spaced vertical battens.
- In providing a sound absorbent surface be sure to use materials which hold their characteristics after painting or redecorating.
- Seats should be upholstered with sound absorbent materials.
- If not the entire floor, at least the exposed aisles should be carpeted.
- Large expanses of glass such as control room observation windows should be pitched so that sound is directed into the audience mass rather than back to the stage.



PLAN



SECTION

ACOUSTICAL WALL TREATMENT

The second major problem is the reduction of the noise level. This may be external noise or internal noise. The popular concrete slab, or steel frame and block walls are very good sound insulation and probably no other precautions are necessary unless these walls have been broken with windows or doors. In this case a lobby or corridor space which wraps around the auditorium is the best insurance against outside interference. A reinforced concrete roof will protect that area, but other roof forms may transmit sound such as traffic from the outside and may serve as a drum head to amplify sound of rainfall. (See Auditorium.) The best protection against noise coming through the lobby and foyer is sound proof doors, or sound traps between the lobby and the auditorium.

Internal noise is the hardest to control. The audience itself is a source of distracting noise as their feet shuffle on an unprotected floor, as they move in a squeaking seat, as they rattle their programs. There is little that can be done about these distractions,but the building noises can be controlled. The most common causes are:

- Opening and closing of doors. All should be fitted with hydraulic door stops.

- Plumbing noises. The fixtures in the rest rooms should not be common wall with any part of the auditorium. Noise of water running in wash basins, toilets being flushed are greatly amplified in the silence of an auditorium. Move these fixtures as far away from the auditorium as

possible and use the quiet equipment.

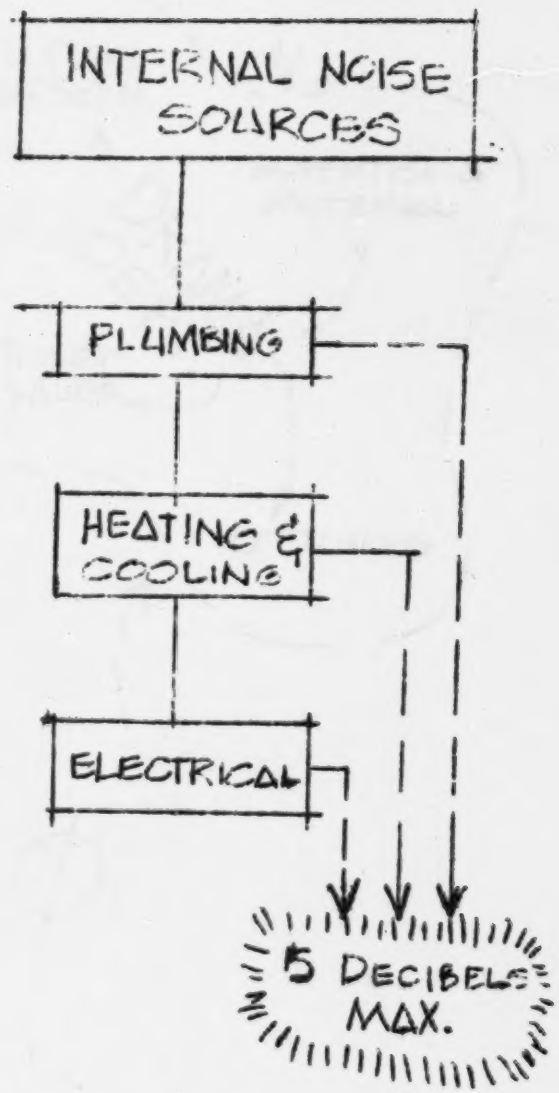
- Heating and air conditioning. This is probably the most common cause of interference. Noise comes from the motors attached to the fans and the water pumps which should be isolated from the walls and floors of the auditorium and with vibration free mounts. A large volume of air through the duct will produce noise unless it is sound proofed (or increased in size). The vents through which air is discharged into the auditorium may have to be increased in size or baffled to reduce the noise produced by the rushing air. Air must enter the auditorium and stage at low velocity.

- Expansion or contraction of ducts or coils may create noise.

- Electrical noise. The usual electrical instruments operated at 115 V will not produce an objectionable noise. However, larger instruments which have fans attached, or arc spots are noisy and may have to be contained. The remote control switchboards do not produce noise themselves, but a vault may be required to hold the noise of magnetic contact switches, transformer hum, etc.

The best protection against sound interference is to specify a maximum decibel reading before the equipment is accepted. If each of the above major installations--plumbing, heating and air conditioning, and electrical are held to a 5 decibel maximum audibility level it is not probable that they will interfere. Tests should be made on the installation of each item separately and in an empty auditorium.

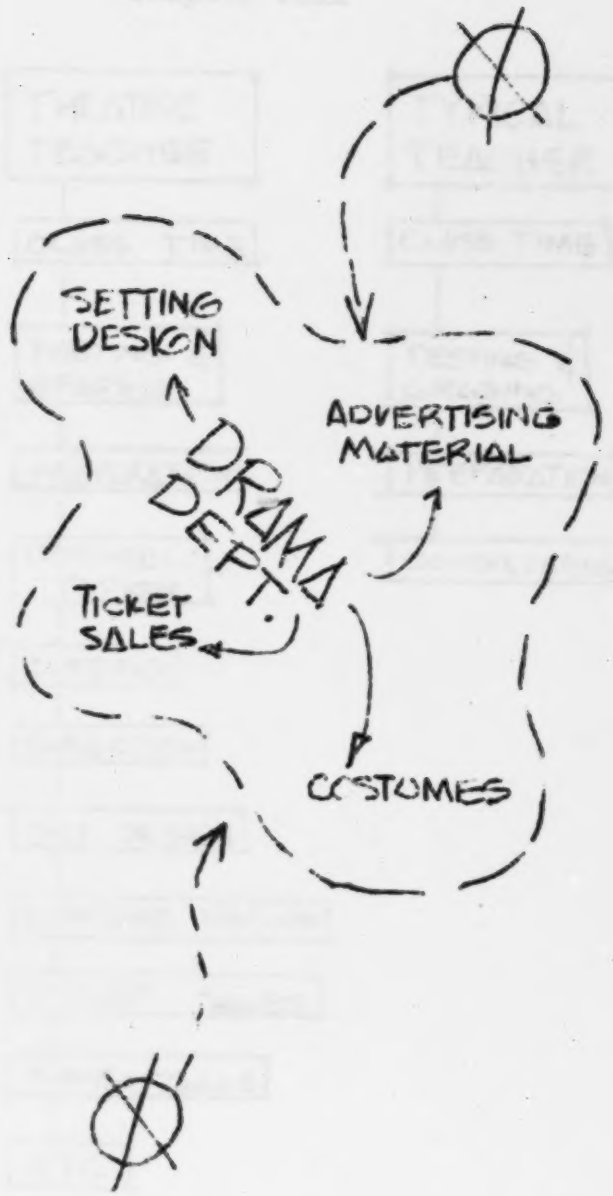
Some theatres have finished the interior of the stage house with sound absorbent material. Although it is wise to protect against noise intruding from the shop, dressing rooms, etc., it is not probable that sounds induced on the stage



will require muffling. The presence of many broken surfaces, textile hangings, scenic items, lines and battens will effectively damper sound reflection and echo. Unless the fly area is full of hanging units, some sound may be trapped there and it may be desirable to introduce a ceiling piece (framed canvas) or for a musical concert, a panel or set of panels (planks) which can be hung overhead to serve as a kind of sound shell. (See Equipment.)

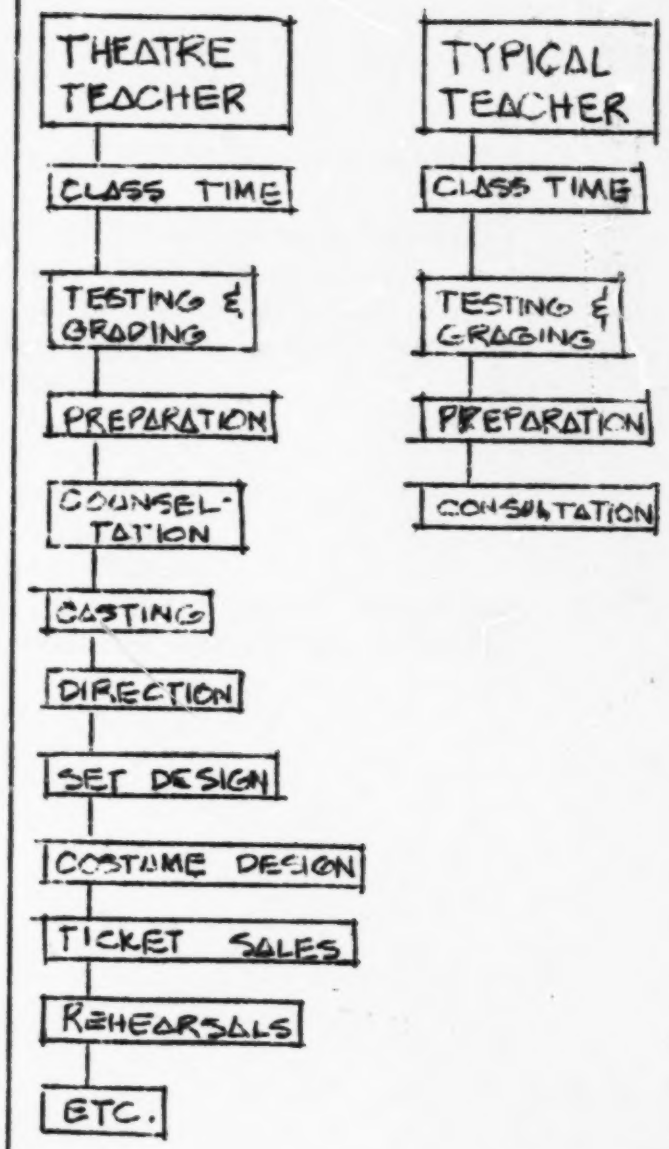
PERSONNEL

In this total proposal the PANEL has assumed that the secondary school theatre will be staffed with teachers who are competent and well trained. The excellent physical accommodations which have been described can only be used effectively by informed personnel. It is not essential that each person be an expert in all areas of instruction, but, if no technician is to be employed, the director must be reasonably qualified in this area. The PANEL cannot recommend the use of outside personnel to service the theatre area. Too frequently it is presumed that settings will be designed by art or mechanical drawing classes, the settings constructed by the industrial arts people, costumes designed and built by sewing classes, advertising material turned cut by the Art Department and the house management and ticket sales managed by the faculty of the Business Department. The entire operation of the theatre must be self-contained in terms of space and



personnel. Although the theatre can use the traditional custodial services for cleaning and general maintenance, it cannot be assumed that janitors or volunteer students can be entrusted to supply the manpower, craftsmanship and technical knowledge which is required in modern theatre instruction. It should also be obvious that the single theatre teacher cannot carry a regular teaching load while performing all of these added physical chores. All of the staff assigned to the theatre must have released time to compensate for the physical demands that are made by the theatre. Some consideration has been given to the employment of non-teaching staff members to handle such problems as tool maintenance, shop instruction, stage crew management and similar duties, but in the opinion of the PANEL it is highly undesirable to introduce non-teaching personnel into the secondary school theatre organization. If conveniently located,the high school might be able to secure the services of a beginning or part-time scene technician from a college or university. Although not a teacher in the school, this individual is academically oriented and will fit into the staff. It is generally agreed that union, civil service, or craft oriented personnel will not work well in the secondary school organization.

In presenting the foregoing material the PANEL indicates its faith in the theatre as being a logical and productive area of study for the secondary school



student. The theatre, like all other areas of instruction in our highly developed educational system, demands well trained teachers who operate in space specifically designed for them and with the best equipment available. Each school, each teaching situation, will require a slightly different solution and the ideal theatre is the ideal one for that time and place. However, there are general principles and recommendations which are common to all. These principles are not utopian, the procedures are not extravagant, and the poeple who formulated the report are practitioners rather than idealists. In presenting this detailed analysis of the teaching space and equipment for the secondary school the PANEL firmly believes that although other solutions may be considered,

"This is what it should be--change it at your own peril!"

EDWARD CYRUS COLE

Acting Dean 1965-66, Associate Professor, Yale University School of Drama, New Haven, Conn.

Author, Designer, Technician and Theatre Consultant

A.B. Dartmouth College

M.F.A. Yale University (Dept. of Drama)

Post Graduate Study

Taught at Yale University as Instructor, Technical Director, Asst. Professor, Associate Professor, Production Manager, Executive Officer and Acting Dean.

Associate Fellow, Timothy Dwight College

Director, 1962, and Executive Secretary, 1962-66, National Council of the Arts in Education

Director, U.S. Institute of Theatre Technology

Fellow, American Educational Theatre Association

Past Director and Past President of American Educational Theatre Association

Director and Executive Comm. American National Theatre and Academy

Member of American National Theatre Association, American Educational Theatre Association, U.S. Institute of Theatre Technology, National Council of the Arts in Education.

Co-Author (with Harold Burris-Meyer) of Theatre and Auditoriums, N.Y. 1949, Reinhold Publ Corp. (second edition completely revised 1964) Co-author (with Harold Burris-Meyer) Scenery for the Theatre, Boston, 1938, Little-Brown & Co.

Theatre Planning Consultant for the following:

American Shakespeare Festival Theatre
Hopkins Center, Dartmouth College
Pickard Theatre, Bowdoin College
Virginia Museum of Fine Arts Theatre
Ohio University Theatre
Bates College Theatre
Wheelock College
Middlebury College
Sweet Briar College
O'Keefe Center, Toronto
Civic Auditorium and Theatre, Vancouver
Denison University: Ace Morgan Theatre

FABER B. DeCHAINE

Associate Professor of Speech, Department of Speech, University of Oregon, Eugene, Oregon

Dramatic Director, Theatre Consultant

B.S. University of Oregon

M.S. Michigan State University

Ph.D. University of Minnesota

Taught at Whitman College, Western Michigan University (Director of University Theatre), University of Minnesota, University of Oregon

Production Stage Manager, Central City Opera House Association (summer)

Director of the All-American Opera Chorus Workshop program

Manuscript Play Project Critic, AETA

Member of the Speech Association of America, American Education Theatre Association

Publication: School Board Journal, Western Michigan Magazine, Player's Magazine

"Space Stage: Fad or Future"
"Drama on the Ice Cap"
"A Battle of Wits"
"Danton's Inferno"

Has participated in these architectural projects:

St Johns Michigan Public Schools
Michigan City, Indiana Public Schools
Trend Associates, Engineers and Architects, Kalamazoo, Michigan
Vicksburg, Michigan, Public Schools
Portage Michigan Public Schools, Michigan
R.H. Erichsen, Structural and Architectural Design, Coos Bay, Oregon
Reedsport, Oregon Public Schools

BROOKS H. GODFREY

Designer, Louis C. Kingscott and Associates, Inc.
Architects-Engineers, Kalamazoo, Michigan

B.S. The Rice University

Designer on the following architectural projects.

Theater-Auditorium, Portage Northern High School,
Portage Michigan Public Schools

Theater-Auditorium, Belleville High School,
Van Buren Public Schools, Belleville, Michigan

Proposed Theater-Auditorium, Otsego High School,
Otsego Public Schools, Michigan

James J. Morisseau, Consultant, Educational Facilities
Laboritories, Inc., New York, N.Y.

George Howard, Consultant, Kliegl Brothers Lighting Co.,
New York, N.Y.

Clarence Hines, Consultant, formerly Superintendent of
Schools, Los Angeles; Associate Dean of Education,
University of Oregon, Eugene.

DRAFTSMAN

Charles W. Raney, University of Oregon, Eugene, Oregon

EDWARD RAGOZZINO

Director of theatre at South Eugene High School, Eugene, Oregon

B.S. University of Oregon, 1952

M.S. University of Oregon, 1956

Producer-Director, Lane County Auditorium Association, Inc., (summer musicals)

Member of American Educational Theatre Association, National Thespian Society (advisor), National Education Association, Oregon Education Association, Eugene Education Assoc.

Board of Directors, Northwest Drama Conference 1958-1963

Consultant to Board of Directors, Lane County Auditorium Association

Governor's Advisory Committee (Oregon) on Arts and Humanities

Board of Directors, Eugene Junior Symphony

Language Arts Norms Committee (Oregon State Dept. of Education)

Past Oregon High School editor, Players Magazine

Architectural projects:

Lane County Auditorium Association, Concept Committee, Consultant to the Board

Educational Specifications for auditorium and teaching stations:

North Eugene High School, Eugene, Oregon
Sheldon High School, Eugene, Oregon
Churchill High School, Eugene, Oregon

ARTHUR C. RISSER

Associate Professor and Head of Department of Engineering Graphics, University of Wichita, Kansas

Architect, Theatre Consultant

B.A. Grinnell College, Grinnell, Iowa

Graduate study: Yale Drama School, Yale University; School of Engineering and Architecture, U. of Minn.

Registered architect in the state of Kansas

Technical Director, Wichita Community Theatre, Kansas

Instructor in theatre production, summer drama workshops, Lake Forest College, Illinois

Board of Directors, Wichita Community Theatre

Membership in Kansas Chapter American Institute of Architects, American Society for Engineering Educ., Sigma Delta Chi (professional journalistic fraternity), National Collegiate Players, American Educational Theatre Association, American National Theatre and Academy, U.S. Institute for Theatre Technology, Illuminating Engineering Society

Sub-Committee of Illuminating Engineering Society for Theatre & Television Lighting and for Lighting in Educ. and Community Theatres

Committee on Auditorium & Theatre Architecture, AIA

Chairman, Theatre Architecture Project, AETA

Chairman, Sub-Committee on Stage Lighting, U.S. Technical Committee E-3.1.9.2, International Commission Illum.

Author of articles appearing in International Journal of Religious Education, The Church School, Progressive Architecture, Players Magazine, Encore, AIA Journal

"Basic Requirements for Church Drama"
"Lighting the Church Stage"
"Include Drama in Your Planning"
"Building and Equipment for Drama"
"Auditorium Ceiling Spotlights"
"Rehousing the Drama" (comments for symposium on -)
"A Portable Dimmer Board"
"A Players Theatre"
"A Theatre in a Multi-Purpose Room"
"Manual for the Construction of a Portable Lighting Control Board"
"The Theatre Building as Architecture"
"Equity, Guidelines for Design"

Theatre projects:

Fine Arts Center, Univ. of Wichita, Kansas
Fine Arts Center, Univ. of Kansas, Lawrence, Kansas
Southeast High School and South High School, Wichita, Kansas
Junction City High School, Kansas
W.S. Hadley Intermediate School, Wichita, Kansas
L.W. Brooks Intermediate School, Wichita, Kansas
Derby High School, Kansas
Bowlus Fine Arts and Cultural Center, Iola, Kansas
Mt. St. Scholastica College, Atchison, Kansas

HORACE W. ROBINSON

Director of the University Theatre and Acting Head of Department of Speech, University of Oregon, Eugene, Oreg.

Dramatic Director, Scene Designer, Technician and Theatre Consultant

B.A. Oklahoma City University

M.A. State University of Iowa

Post Graduate Study at Stanford University

Taught at Oklahoma City University, University of Montana, University of California at Los Angeles, and University of Oregon

Fulbright Lecture Scholar in Australia

Fulbright Research Scholar in Finland

Originator and First Chairman of the Theatre Architecture Project of AETA

Past President of the American Educational Theatre Association

Member of the Speech Association of America, Western Speech Association, National Theatre Conference, U.S. Institute of Theatre Technology

Author of articles on theatre architecture appearing in Theatre Arts, Educational Theatre Journal, Bulletin Of The Secondary School Superintendents, Players Magazine, World Theatre, etc.

"Teaching Facilities for Theatre in Secondary Schools"
"An Approach to Theatre Planning"
"Theatre Architects, vs. Theatre Personnel"
"Old Building, New Theatre"
"The Flexible Theatre in America"
"Theatre Architecture Stage D Sign, Stage Craft"
"Auditorium and Stage Facilities"

Consultant on theatre architecture to the Los Angeles City School Board

Consultant for theatre structures in secondary schools, colleges and University, civic auditoriums, etc. Representative works at:

Modesto College, Modesto California
University of Sydney, Sydney, N.S.W. Australia
Catawba College, Salisbury, North Carolina
Stockton Junior College, California
University of New Hampshire
University of Pudget Sound
Los Angeles City College
Redding Civic Auditorium, California
University of Oregon
College of the Desert, Palm Desert, California

WALLACE SMITH

Director of Auditorium Activities, Evanston Township High School, Evanston, Ill.

B.A. Baldwin-Wallace College

M.A. Northwestern University

Additional work at Northwestern University

Chairman, Drama Department, Governor's Honors Program, State Department of Education, Atlanta, Georgia

Past President, Northeastern Ohio Drama Teachers Assoc.

Past National Director, Secondary School Theatre Conf.

Membership in NEA, Illinois Speech Association, Centra States Speech Association, SAA, AETA, USITT.

Sometime member, Board of Director, American Educational Theatre Association

Member of committee on"Course of Study in Theatre Arts", SSTC

Critic for High School Play Festivals:

Univ. of Minnesota
Univ. of Iowa
Catholic Theatre Conference
Chicago Drama Festival

Author of varied articles on high school theatre, including:

"A Theatre Not So Absurd"
"Theatre in Community Education"

DONALD SWINNEY

Asscciate Professor of Drama, Director of the Graduate Program, Departmental Business Manager, Director of the Playhouse, Hofstra University, Hempstead, New York

Scenic Designer, Technical Director, Theatre Consultant

B.A. University of Idaho

M.A. University of Idaho

Ph.D. Indiana University

Taught at University of Denver, Hofstra University

Four years theatre summer stock

Technical Director, Indianapolis Civic Theatre

Assistant Technical Director, Opera Production, Indiana Univ.

Production Director, Long Island (N.Y.) Arts Festival

President, United States Institute for Theatre Technology

Board of Directors, U.S. Institute for Theatre Technology. Former Technical Secretary

Board of Directors, American Educational Theatre Association, Former Managing Editor, Educational Theatre Journal

Membership in United Institute for Theatre Technology, American Educational Theatre Association, National Council on the Arts and Government

Publication:

"The Globe Playhouse at Hofstra"
"The Izenour Synchronous Winch System"

Theatre Consultant on the following representative projects:

The Hofstra Playhouse, Hofstra University, Hempstead, N.Y.
John F. Kennedy Theatre, Univ. of Hawaii, Honolulu
Municipal Theatre-Auditorium, Honolulu, Hawaii
Rubin Dario Theatre, Managua, Nicaragua

LENORE ZAPELL

Ph.D. candidate in Theatre, Department of Speech, University of Oregon

B.A. College of St. Benedict, St. Joseph, Minnesota

M.S. Southern Oregon College, Ashland, Oregon

Teacher, Director of theatre, Medford Senior High School, Medford, Oregon

Director, Civic Theatre, Medford, Oregon

Member American Educational Theatre Association, Secondary School Theatre Conference

Developed theatre arts teaching station, Medford Senior High

Planned theatre complex, teaching station, new Medford Senior High (to open Fall, 1967).

APPENDIX B - BOOKS and PAMPHLETS

Adix, Vern THEATRE SCENECRAFT (The Children's Theatre Press, 1956. Cloverlot, Anchorage, Ky.)

Barber, Philip THE SCENE TECHNICIAN'S HANDBOOK (New Haven: Whitlock's Book Store, 1928) (This is now a part of: Gassner, John PRODUCING THE PLAY (New York: The Dryden Press, 1941)

Bentham, F. STAGE LIGHTING (2nd ed) (New York: Macmillan, 1955)

Bowman, Wayne MODERN THEATRE LIGHTING (New York: Harper and Brothers, 1957) (rev) 10:3 (Oct. 58)

Bowman, William C. & Glorianne Engel PLANNING FOR THE THEATRE (Dept. of Speech and Theatre Arts, Univ. of Pittsburgh, Pittsburgh, Pa.) (Feb. 1965)

Boyle, Walden P. CENTRAL AND FLEXIBLE STAGING (Berkeley, California: University of California Press, 1956)

Buerki, Fred A. STAGECRAFT FOR NON-PROFESSIONALS (Madison: University of Wisconsin Press, 1945)

Burris-Meyer, Harold, and Cole, Edward C. SCENERY FOR THE THEATRE (Boston: Little Brown and Co., 1938)

_____ THEATRES AND AUDITORIUMS(2nd ed) (New York, Reinhold 1964) (1st ed 1949)

_____ and Goodfriend. L.S., ACOUSTICS FOR THE ARCHITECT (New York: Reinhold Publishing Corp., 1957)

_____ and Mallory, Vincent SOUND IN THE THEATRE (Mineola, New York: Radio Magazine, Inc. 1959)

Cornberg, Sol, and Gebauer, Emanuel I.A STAGECREW HANDBOOK (New York: Harper and Bros., 1941) Rev ed 1957

Corry, Percy PLANNING THE STAGE (New York: Pitman Publishing Corporation, 1961)

Davis, Ariel R. (ed) LIGHTING THE MODERN STAGE (Salt Lake City, Ariel Davis Manufacturing Co. 1958) ("Planning the Auditorium and Stage")

"Divisible Auditoriums" (Case Studies of Educational Facilities #11) (New York, Educational Facilities Laboratories 1966)

Fuchs, Theodore, STAGE LIGHTING (New York: Little Brown and Co., 1929)

Gillette, A.S. STAGE SCENERY (New York: Harper & Brothers, 1959)

Hake, Herbert V. HERE'S HOW (New York: Samuel French, Inc. 1942) (Rev ed 1958) (Orig publisher: Evanston: Row, Peterson)

Hauf, Harold D., et al NEW SPACES FOR LEARNING: DESIGNING COLLEGE FACILITIES TO UTILIZE INSTRUCTIONAL AIDS AND MEDIA (Troy, N.Y., Tensselear Polytechnic Institute, Revised 1966)

Jones, Margo THEATRE-IN-THE-ROUND (New York, Rinehart & Co. 1951) ("The Theatre Plant")

Knudsen, V.O. and Harris, C.M. ACOUSTICAL DESIGNING IN ARCHITECTURE (New York, John Wiley and Sons 1950) ("Auditoriums")

Lustig, Edgar L. MODERN THEATRES - EVEN FOR THE HIGH SCHOOL (Part I) (St. Louis: Theatre Technology Inc.) (1962)

McCandless, Stanley A METHOD OF LIGHTING THE STAGE (New York: Theatre Arts, 1932)

Mielziner, Jo "The Future of Theatre Architecture" FUTURES IN AMERICAN THEATRE (Austin, Univ. of Texas, 1963)

Miller, James H. DESIGNING AND EQUIPPING THE THEATRE (A Service Publication by the Southwest Theatre Conference; Albuquerque, New Mexico, James Hull Miller 1954)

National Education Association PLANNING SCHOOLS FOR USE OF AUDIO-VISUAL MATERIAL; No. 2: AUDITORIUMS (Washington, D.C., Department of Audio-Visual Education, The Association 1953)

Nelms, Henning A PRIMER OF STAGECRAFT (New York: Dramatists Play Service 1941)

_____ LIGHTING THE AMATEUR STAGE (New York: Theatre Arts Inc., 1931)

NEW BUILDING ON CAMPUS: SIX DESIGNS FOR A COLLEGE COMMUNICATIONS CENTER (Case Studies of Educational Facilities #7) (New York, Educational Facilities Laboratories, 1963)

Peet, Telfair Boys A SYSTEM OF PORTABLE STAGE SETTING AND LIGHTING (Alabama, Auburn: 1950)

Philippi, Herbert STAGECRAFT AND SCENE DESIGN (Boston: Houghton Mifflin Co., 1953)

Risser, Arthur C. A THEATRE IN A MULTI-PURPOSE ROOM (Santa Fe, New Mexico: Inland America Theatre Service, 1963)

Rubin, Joel E. and Watson, Leland H. THEATRICAL LIGHTING PRACTICE (New York: Theatre Arts 1955)

Selden, Samuel and Sellman, Hunton D. STAGE SCENERY AND LIGHTING (New York: F.S. Crofts and Co., 1930, Rev ed 1936) (Rev ed Appleton-Century-Crofts, 1958)

University of Michigan College of Architecture and Design PAPERS PRESENTED AT THE EIGHTH ANN ARBOR CONFERENCE: THE THEATRE (Ann Arbor: The College, 1950) (Papers by Fuchs, Izenour, Rosenthal, Feder, Stainton, Robinson, etc)

University of the State of New York, Division of School Buildings and Grounds PLANNING THE SCHOOL AUDITORIUM (Albany, The University 1948)

ARTICLES AND PERIODICALS

Allen, Carl J. "Lighting the School Auditorium and Stage" PROG ARCH XXXII (Aug 1951) 88-94

Allio, Rene "Plan for a Flexible Theatre" WORLD THEATRE IV No. 3, 31-34

Unknown, "Are Large Assembly Areas as Valuable as Small Theatres?" ARCHITECTURAL FORUM, 91 (Oct. 49) 155.

Bell, Millard D. "Dual-Purpose Auditorium" THE NATION'S SCHOOLS (Sept 1951) 52-53

Bel Geddes, Norman "Flexible Theatre; with Comment by H. Lindsay" THEATRE ARTS (June 48) 48-49

_____ et. al. "Theatre Planning; A Symposium" EDUCATIONAL THEATRE JOURNAL (March 50) 1-7

Blundell, W.I. and Perkins, L.B. "School Auditorium; Its Purpose and Design" AM SCH & UNIV (25th Yearbook) (1953) 271-276

Bolt, R.H. and Newman, R.B. "Architectural Acoustics; Basic Planning Aspects" ARCHITECTURAL RECORD (April 50) 165-168

Burris-Meyer, H. and Cole, Edward C. "The Audience Hears" PROG ARCH XXVIII (Oct. 1947) 76-80

_____ "The Audience Sees" PROG ARCH XXIX (May 1948) 88-90

_____ and Goodfriend, L.F. ACOUSTICS FOR THE ARCHITECT (New York, Reinhold 1957)

Cole, Edward C. "Auditorium Stage for a School Building" SCH EXECUTIVE LXV (June 1946) 42-45

_____"Theatre Architecture and the Technician" EDUC THEATRE JOURNAL (Oct. 50) 222-227

_____(ed.) "Theatre: USA; Theatre Architecture: Mid-Century" THEATRE ARTS (May 51) 44-50, 90

Cole, Wendell "Some Contemporary Trends in Theatre Architecture" EDUC THEATRE JOURNAL VII No. 1 (March 1955) 16-21

Cognait, Raymond "The Theatre Facade, Entrances and Auditoriums" WORLD THEATRE 85-107

Corry, Percy "Planning for Dramatic Education" TABS Magazine, Vol 24, No. 1 (1966) 29-39

Davis, E.C."Theatre Plant" NATIONAL ASSOCIATION OF SECONDARY SCHOOL PRINCIPALS BULLETIN XXXII (Jan 1948) 92-97

Davis, William M. "Educational Theatres and Auditoriums" CHURCH PROPERTY ADMINISTRATION XXIII (April 1959) 170

DeGaetani, Thomas "Theatre Architecture" AIA JOURNAL XXXVI No. 2 (Aug 1961) 70-76

"Essentials of Stage Design for Schools" AM SCH & UNIV (28th Yearbook) (1954) 159 (Author unknown)

Fuchs, Theodore "Planning a Stage Lighting Installation for a Modern School Auditorium" ILLUMINATION ENGINEERING XLVIII (June 1953) 348-353

_____"Stage Facilities for the Elementary School" PLAYERS MAGAZINE, 33 (Oct. 56) 6-7

Gillette, Arnold S. "The Auditorium for the Small High School" THE AMERICAN SCHOOL BOARD JOURNAL CXII (Jan 1946) 47-48

Gillies, H.W. "Planning the School Auditorium to Serve the Community's Needs" SCH EXECUTIVE LXX (Aug 1951) 19-22

Green, Alan C. "The Auditorium as Instructional Space" ARCH REC (Oct 1962) 168-171

Howard, George T. "Automation or Mechanization" EDUCATIONAL THEATRE JOURNAL 10:3 (Oct. 58) 250-253

Hunt, H.C. "Factors Which Determine the Size of an Auditorium" SCH EXECUTIVE LXV (June 1946) 35-37

Iron, William "The High School Multi-Purpose Theatre: A Critical Study" CURRICULUM BULLETIN (University of Oregon XVII) (Dec 1961)

Knudsen, V.O. and Harris, C.M. "Acoustical Design of the Theatre" ARCH REC CIV (Nov 1948) 139-144

Lauterer, Arch, McConnell, Frederic and Hare, Michael "Architecture for the Theatre" THEATRE ARTS (Sept 1946) 3 articles 538-552

Leacroft, Richard "The Open Stage" ARCHITECTURAL REVIEW (April 59) 255-262

Long, G. Allison, Jr. "Lighting the Small Amateur Stage" ILLUMINATING ENGINEERING, 49 (July 54) 331-339

Lounsbury, Warren and Davis, A.G. "Lighting the Center Stage" PLAYERS MAGAZINE, 31 (Feb. 55) 114

McCandless, Stanley "Lighting the School Auditorium and Stage" SCH EXECUTIVE LXV (June 1946) 45-48

_____ "Lighting the Small School Stage" ARCHITECTURAL RECORD, 117 (May 1955) 230-233: 235

_____, Rubin, Joel and Kliegl, Herbert"Stage Lighting - A Survey Since 1906" ILLUMINATING ENGINEERING, 51 (Jan. 56) 113-122

Macgowan, Kenneth and Morrison, Jack "Grid Versus No Grid" SCH EXECUTIVE LXVIII (Nov 1948) 62-63

"The Man Who Tried to Improve High School Stages" ARCH FORUM CV No. 4 (Oct. 1956) 141 (Author unknown)

Marano, Gerald G. "In Defense of Arena Staging" NATIONAL ASSOCIATION OF SECONDARY SCHOOL PRINCIPALS BULLETIN (June 50) 35-37

Meisel, Burton E. "Amateur Lighting" PLAYERS MAGAZINE 34 (Nov. 57) 33-34

Miller, James Hull "Before You Build That Theatre" THEATRE ARTS XLV No. 8 (Aug 1961) 66-67, 77

_____"The General Auditorium" AIA JOURNAL (Aug 1960) 73-78

_____, et. al. "Initial Factors in Theatre Planning" EDUC THEATRE J VIII No. 2 (May 1956) 89-96

_____ "The Open Stage" PLAYERS MAGAZINE XXXIII No. 5 (Feb. 1957) 100-101

Morgan, R.R. "Planning the High School Auditorium" HIGH SCHOOL JOURNAL XXXIII (Mar 1950) 83-85

Nichols, J.E. "Inexcusable Mistakes in Planning School Auditoriums" SCHOOL MANAGEMENT XIX No. 5 (Dec. 1949) 6-7

Pawley, Eric "School Plant Studies; Educational Theatre Architecture" AM INST ARCH J XXVIII (Nov 1957) 423-42

Risser, Arthur C. "A Player's Theatre" PLAYERS MAGAZINE (Dec 1962) 70-73

Robinson, Horace W. "An Approach to Theatre Planning" EDUC THEATRE JOURNAL I No. 2 (Dec 1949) 95-99

_____ "Auditorium and Stage Facilities" NATIONAL ASSOCIATION OF SECONDARY SCHOOL PRINCIPALS BULLETIN XXXIII No. 166 (Dec 1949) 159-172

_____ "The Flexible Theatre in America" WORLD THEATRE IV No. 3 , 11-21

_____ "Teaching Facilities for Theatre in Secondary Schools" ETJ XVI No 3 (Oct 1964) 212-219

_____ "Theatre Architects vs. Theatre Personnel" EDUCATIONAL THEATRE JOURNAL (March 50) 8-10

Robinson, Marion P. "Don'ts for Theatre Builders" EDUC THEATRE JOURNAL III No. 3 (Oct. 1951) 249-254

Rosenthal, Jean "Lighting for the Theatre" MUSICAL AMERICA 74 (Feb. 15, 54) 13

Rubin, Joel E. "Lighting Facilities for the High School Stage, Part II" DRAMATICS, 27 (Jan 56) 8-9, 34

"School Auditorium" SCH EXECUTIVE LXV (June 1946) 34-50 (Author unknown)

Sharp, J. Stanley "School Auditorium Planning Considerations" ARCH REC (Oct 1962) 165-168

Shaw, Phyllis "A High School Theatre" PLAYERS MAGAZINE XXXI No. 7 (April 1955) 155

Smith, Harvey K. "Common Hazards of the School and College Theatre" EDUC THEATRE JOURNAL II No 1 (Mar 1950) 32-36

Stainton, Walter H. "Stage Lighting" PLAYERS MAGAZINE, 29 (Feb. 53) 102-103

"Theatre Planning: A Symposium" 2:1 EDUCATIONAL THEATRE JOURNAL (Mar 50) 89 (Author unknown)

"Theatres-In-The-Round" ARCHITECTURAL FORUM, 93 (Sept. 50) 66-71 (Author unknown)

Unruh, Walther "Types of Adaptable Forestage" WORLD THEATRE (1953 ;No. 4) 35

Work, William "In Defense of Conservatism in Theatre Architecture" PLAYERS MAGAZINE (Nov. 1962) 40-41

UNPUBLISHED MATERIAL

Bowman, Ned A. "Contemporary Theatre Architecture: Two Divergent Perceptual Concepts" Ph.D. dissertation, Stanford University, 1963.

DeChaine, Faber B. "An Historical Survey of Multiple Theatre Architecture Since 1900" M.A. Thesis, Michigan State University, 1953.

Fox, Howard "Principles for Designing the High School Auditorium" Ph.D. dissertation, New York University, 1960.

Iron, William Z. "A Survey of the Factors Affecting the Use of a Multi-Purpose Area as a Secondary School Theatre and a Specific Analysis of Theatre-Cafeteria Utility" M.A. thesis, University of Oregon, 1960.

Watson, Thomas "A Study of Contemporary Theatre Planning and Architectural Design for the Educational Theatre" Ph.D. dissertation, Dept. of Dramatic Arts, Western Reserve University, 1964. (Available from Watson, University of Buffalo, N.Y.)